# ACTIVITY BASED SAMPLING SUMMARY REPORT

## WORKER RECEPTORS

LIBBY, MONTANA OPERABLE UNIT 6
LIBBY, MONTANA

Prepared For:



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Project #: 5539-120



#### **EXECUTIVE SUMMARY**

The following document has been prepared to summarize the methods used and results of an Activity Based Sampling (ABS) event conducted in September 2008 at the request of the U.S. Environmental Protection Agency (EPA).

The ABS event was designed to evaluate potential exposure to two populations: BNSF Railway Company (BNSF) Maintenance of Way (MOW) workers (Workers) and the general public (Public). This report will focus on the sampling and results conducted on Worker population. Sampling and results of the Public assessment will be published under separate cover.

#### **INTRODUCTION**

The Libby asbestos site has been on the National Priorities List since 2002 and encompasses the towns of Libby and Troy, Montana, the former W.R. Grace mine-site and several other Operable Units (OU). Property owned by the BNSF Railway Company (BNSF) has been designated OU6 and is defined geographically by the BNSF property boundaries and extent of contamination associated with the railyard and other Right of Way (ROW). Generally OU6 is as wide as the ROW (CDM, 2008) with the western and eastern limits being defined by limits of OU7 and OU4, respectively (Figure 1).

In preparation for the 2008 ABS event the following documents were prepared to govern the sampling, analysis and safety aspects of the project:

- Worker Receptor Sampling and Analysis Plan (Worker SAP) (AECOM, 2008a);
- Public Receptor Sampling and Analysis Plan (Public SAP) (AECOM, 2008b);
- Project-specific Health and Safety Plan (HSP) (EMR, 2008); and
- SAP analytical summaries.

Collectively these documents served to provide guidance in the collection and analysis of samples and to govern health and safety procedures. The focus of this report will be methods and procedures defined in the Worker SAP.

#### SAMPLING AND ANALYTICAL

Personal air samples were collected from Workers to evaluate their potential exposure risk during rail maintenance activities. Camp, Dresser and McKey (CDM) personnel provided sampling oversight on behalf of the EPA.

All air samples were submitted to CDM for analysis by EMSL Analytical, Inc. (EMSL) utilizing ISO 10312 methods.



Activity Based Sampling Summary Report – Worker Receptors
Libby, Montana Operable Unit 6
March 12, 2010
EMR Project # 5539-120

#### **RESULTS**

A total of 12 Worker personal air samples were collected during the ABS event. All but three (3) samples (BA-00002, BA-00037, and BA-000038) met the target analytical sensitivity of 0.0024 structures/cubic centimeter. All worker air samples were non-detect for LA, Other Amphibole (OA) and Chrysotile.

A total of 8 blank samples were collected and submitted for analysis. Three of the blanks were not analyzed at the discretion of EMSL and were archived. All of the blanks were non-detect.



## TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
INTRODUCTION	i
SAMPLING AND ANALYTICAL	i
RESULTS	ii
LIST OF TABLES	V
LIST OF FIGURES	V
LIST OF APPENDICIES	V
LIST OF ACRONYMS	vi
1.0 SITE LOCATION	1
2.0 ABS PREPARATION	2
2.1 ABS Docments	2
2.1.1 Public Receptor Sampling and Analysis Plan	2
2.1.2 Health and Safety Plan	2
2.1.3 SAP Analytical Summaries	2
2.2 Site Specfic Procedures	2
2.3 Personal Air Sampling Methods and Equipment	3
2.4 Sample Identification Numbers	3
3.0 DOCUMENTATION PROGRAM	4
3.1 Field Notes	4
3.2 Field Sample Data Sheets	4
4.0 SAMPLE ANALYSIS	5
4.1 Analytical Methods	5
4.1.1 TEM Analysis	5
5.0 SAMPLING PROGRAM	7
5.1 Sampling Areas	7
5.2 Deviations from SAP	7
5.3 Worker Air Sampling	8
5.4 Sample Identification Numbers	
6.0 SAMPLING SUMMARY	9
6.1 September 17, 2008	9



6.2 September 18, 2008	9
6.3 September 19, 2008	
6.4 September 22, 2008	9
6.5 September 23, 2008	10
6.6 September 24, 2008	10
6.7 September 25, 2008	10
7.0 DISCUSSION OF RESULTS	11
7.1 Worker Personnel Air Sampling Results	11
7.2 Air Sample Blank Results	11
8.0 REFERENCES	12
9.0 STANDARD OF CARE	13



### LIST OF TABLES

- Table 1. Summary of ABS Air Sampling Results
- Table 2. Summary of Soil Sampling PLM-VE (Fine Fraction) Results
- Table 3. Summary of Soil Sampling PLM-Gravimetric (Coarse Fraction) Results

#### LIST OF FIGURES

- Figure 1. Site Location Map
- Figure 2. OU6 Overview Map Showing Commonly Referenced Features
- Figure 3. Daily Sampling Area Map

#### LIST OF APPENDICIES

Appendix A. Analytical Summaries

Appendix B. Field Notes

Appendix C. Field Sampling Data Sheets - Air

Appendix D. Field Change Orders

Appendix E. Worker Air Sample Laboratory Reports



#### LIST OF ACRONYMS

ABS - Activity Based Sampling

BNSF - BNSF Railway Company

C – Chrysotile

CDM - Camp, Dresser and McKee

EMSL - EMSL Analytical, Inc

EPA – U.S. Environmental Protection Agency

FCO - Field Change Order

FSDS - Field Sampling Data Sheets

HSP - Health and Safety Plan

ISO – International Organization for Standardization

L/m - Liters per minute

LA - Libby Amphibole

MCE - Mixed Cellulose Ester

MOW - Maintenance of Way

MP - Mile Post

NIOSH - National Institute for Occupational Safety and Health

OA – Other Amphibole

OU6 - Operable Unit 6

PCM – Phase Contrast Microscopy

PPE - Personal Protective Equipment

QA/QC - Quality Assurance/Quality Control

ROW – Right of Way

RP - Rail Production

s/cc – Structures per cubic centimeter

SAP - Sampling and Analysis Plan

SOP – Standard Operating Procedure

TEM – Transmission Electron Microscopy



#### 1.0 SITE LOCATION

The Libby asbestos site has been on the National Priorities List since 2002 and encompasses the towns of Libby and Troy, Montana, the former W.R. Grace mine-site and several other Operable Units (OU). Property owned by the BNSF Railway Company (BNSF) has been designated OU6 and is defined geographically by the BNSF property boundaries and extent of contamination associated with the railyard and other Right of Way (ROW).

In general, OU6 is as wide as the ROW (CDM, 2007). Although no formal geographic boundaries have been established for the western or eastern limits of OU6, EPA's agent, Camp, Dresser and McKee (CDM) has used the limits of OU4 to define the east side boundary and the limits of OU7 defined the west side boundary (Figure 1) (CDM, 2007). These limits roughly correlate to BNSF Mile Post (MP) 1301.5 on the east to MP 1342 on the west (Figure 2).

OU6 is encompassed by BNSF's Kootenai River Subdivision that extends westward from Whitefish, Montana to Sandpoint, Idaho. Approximately 40 trains per day pass over the Kootenai River Subdivision. The portion of the Kootenai River subdivision within OU6 is single track with passing sidings that allow the passing of trains traveling in opposite directions. Passing sidings within OU6 are located at following locations (from east to west) (Figure 2):

- Riverview (MP 1306.9)
- Ripley (MP 1312.2)
- Libby (MP 1319.6)
- Kootenai Falls (MP 1331.3)
- Troy (MP 1337.9)

Two small railyards are present at Libby and Troy (Figure 2) and an industrial spur is present at the east end of Libby. From MP 1301.5 to approximately 1307.5 the BNSF ROW parallels Fisher River and then follows the Kootenai River from 1307.5 to the west end of OU6 (Figure 2).



#### 2.0 ABS PREPARATION

#### 2.1 ABS Docments

In preparation for the 2008 Activity Based Sampling (ABS) event, a series of documents were prepared to govern the sampling, analysis and safety aspects of the project. The following is a brief description of purpose of each document that pertains to the Worker Receptor portion of the ABS event.

#### 2.1.1 PUBLIC RECEPTOR SAMPLING AND ANALYSIS PLAN

The Worker Receptor Sampling and Analysis Plan (Worker SAP) (AECOM, October, 2008a) detailed the methods and procedures that were utilized during the collection of personal air samples of BNSF Maintenance of Way (MOW) workers. The focus of the Worker SAP was to assess the potential exposure of BNSF workers to airborne Libby Amphibole (LA) during rail maintenance activities.

#### 2.1.2 HEALTH AND SAFETY PLAN

A project-specific Health and Safety Plan (HSP) was developed to cover safety and Personal Protective Equipment (PPE) issues for personnel involved with the sampling activities (EMR, 2008). The HSP was not developed as a site specific plan since the work sites would be changing daily. In addition to the HSP, all sampling personnel attended daily BNSF safety briefing that included job specific details including planned work activities, area specific hazards and weather forecasts.

#### 2.1.3 SAP ANALYTICAL SUMMARIES

A SAP analytical summary was developed for samples collected under the Worker SAP. The analytical summary was approved by the EPA, EPA agents and contracted laboratories. The purpose of the analytical summary was to condense the analytical parameters specified in the Worker SAP into an easily referenced guide for the laboratory. The approved Worker Receptor analytical summary is included in Appendix A.

#### 2.2 Site Specfic Procedures

Prior to initiating ABS sampling, EMR field staff received training from CDM on Field Sample Data Sheet (FSDS) procedures that are specific to the Libby Superfund Site. The FSDS training did not follow a specific Standard Operating Procedure (SOP), but rather focused on the procedures to be followed for completion of FSDS forms and the submission of air and soil samples for analysis.



#### 2.3 Personal Air Sampling Methods and Equipment

Personal air samples were collected to evaluate air quality for BNSF workers (Workers). Two Worker personal air samples were collected each work day to evaluate potential exposure of BNSF maintenance workers to fiber releases. The samples were split between machine operator and laborer positions within the gang.

Personal air samples were collected using Gillian BDX II personal air pumps equipped with Zefon 25mm Phase Contrast Microscopy (PCM) cassettes with 0.8 µm Mixed Cellulose Ester (MCE) filters. Personal air samples were collected at flow rates that ranged between 1.4 Liters/minute (L/m) and 2.8 L/m, as determined by testing with a calibrated rotameter at the beginning and ending of the day. These cassettes were utilized for both PCM analysis by National Institute for Occupational Safety and Health (NIOSH) Method 7400 and Transmission Electron Microscopy (TEM) analysis by the International Organization for Standardization (ISO) Method 10312. All personal air samples requiring fixed laboratory analysis were submitted to CDM for analysis by EMSL Analytical, Inc (EMSL). Copies of the FSDSs for the Worker Receptor personal air samples are found in Appendix B.

It should be noted that additional matricies were sampled and other data, including meteorological data and field notes, was gathered during the ABS event. In order to avoid redundancies, these additional data sets are discussed in the 2008 Activity Based Sampling Summary Report – Public Receptors (EMR, 2009).

#### 2.4 Sample Identification Numbers

All samples were assigned a unique sample identification consisting of a prefix followed by a five digit number that signify the order in which the samples were collected. All sample identifications were pre-assigned by CDM. Air samples were designated by a BA prefix while the Location IDs used during the collection of air samples (AD-005568) were also assigned by CDM.



#### 3.0 DOCUMENTATION PROGRAM

#### 3.1 Field Notes

Two sets of field notes were collected by EMR personnel, one maintained by the soil sampling crew while the other was maintained by personnel outside the work area. These notes apply to both the Worker and Public Receptor portions of the ABS event and contain details regarding general field conditions, sample location information, soil descriptions, and timing of work completed. All notes were kept in bound field books and copies are found in Appendix B.

#### 3.2 Field Sample Data Sheets

Information for each sample collected was logged on FSDSs that were provided by CDM. Three types of FSDSs were provided by CDM: 1) personal air samples; 2) stationary air samples; and 3) soil samples. FSDSs were completed by EMR personnel using CDM-assigned sample numbering labels as well as sample specific data. Personal air sample FSDSs are found in Appendix B.

Additional documentation of field events and sampling conditions was collected during the ABS event. In order to avoid redundancies, these additional data sets are discussed in the *2008 Activity Based Sampling Summary Report – Public Scenario* (EMR, 2010).



#### 4.0 SAMPLE ANALYSIS

#### 4.1 Analytical Methods

All samples collected during the ABS event were submitted to the CDM Libby, Montana office. After approval of the analytical summary sheets, CDM generated chain of custody forms and submitted all Worker air samples to EMSL's Libby, Montana laboratory. The following is a brief discussion of the analytical methods used in the analysis of the ABS samples.

#### 4.1.1 TEM ANALYSIS

Worker air samples were submitted for TEM analysis using the International Organization for Standardization (ISO) 10312 methodology. This method determines and counts the type(s) of asbestos structure present, but sometimes cannot discriminate between individual fibers of amphibole and non-asbestos analogues of the same amphibole mineral. The method categorizes structures of various lengths and widths into "bins" to count the various fractions of Libby Amphibole (LA), Other Amphibole (OA) and Chrysotile (C). The method specifies six bins that are characterized as follows:

- Bin A: All LA, OA and C fibers with a length to width aspect ratio less than 5:1;
- Bin B: All LA, OA and C fibers with a length to width aspect ratio greater than or equal to 5:1 and length less than 0.5 μm;
- Bin C: All LA, OA and C fibers with an a length to width aspect ratio greater than or equal to 5:1 and width less than or equal to 0.5 µm;
- Bin D: All LA, OA and C fibers with a length to width aspect ratio greater than or equal to 5:1, with fiber length between 0.5 μm and 5 μm;
- Bin E: All LA, OA and C fibers with a length to width aspect ratio greater than or equal to 5:1, length between 5 and 10 microns and width less than or equal to 0.5 µm; and
- Bin F: All LA, OA and C fibers with a length to width aspect ratio greater than or equal to 5:1, length greater than 10 μm and width less than or equal to 0.5 μm.

Results are expressed in units of structures per cubic centimeter (s/cc) (Table 1).

A total of 4 worker air samples required indirect preparation methods due to overloading of the sample filter. All other samples were directly prepared.

Overloading can be caused by a number of environmental factors including the intake of high concentrations of natural airborne dust, high concentrations of airborne pollen or seeds and clothing fibers. The purpose of indirect preparation is to remove any organic material that was recovered during the sampling process to allow for accurate analysis of the sample. Indirect preparation includes the following steps:



- Organic materials (including the filter) are oxidized (ashed) using a plasma oxidation chamber;
- the materials that survive the oxidation process are re-suspended in water and then redeposited on a new filter;
- The new filter is analyzed using the same methods as a direct preparation sample.



#### 5.0 SAMPLING PROGRAM

#### 5.1 Sampling Areas

EMR personnel consulted with the BNSF Rail Production (RP) -15 and RP-21 Roadmasters on a daily basis to determine the planned activities and the exact work area in which sampling would take place. On several days a particular gang and its personnel would complete multiple projects. Since Worker sampling was initiated at the beginning of the work day and continued until the end, Worker data represents the conditions throughout a work day instead of a specific project.

#### 5.2 Deviations from SAP

The ABS event was conducted in accordance with the procedures described in the Worker SAPs except when field conditions warranted a deviation. The following is a discussion of deviations from the Worker SAP that were incorporated into the sampling process based on field conditions. All deviations were documented on Field Change Order (FCO) forms and those that apply to the Worker SAP are discussed below and are found in Appendix C. Many of the deviations resulted from determining actual field conditions versus those speculated during the SAP development.

- FCO #17-1: A flow rate of 5 L/m could not be achieved with the personal pumps. Reduced flow rates increased the duration of sampling events from 4 hours to 8 hours.
- FCO #17-3: The SAP assumed that no train traffic would pass through the sampling area. On day 1 train traffic was allowed to pass through the sampling area during maintenance and sampling activities. All subsequent trains passing through the sampling area were recorded in the field book.
- FCO #17-6: Worker sampling event duration is variable and is not under the control of the sampling team. The SAP called for maximum sample duration of 4 hours for workers. Pumps were placed on workers at the beginning of a shift and retrieved at the end of the shift. The increased duration may result in filter overloading.
- FCO #18-2: Assessed and reduced Worker air sample flow rate from 2.8L/m to 1.0 L/m to reduce filter overloading.
- FCO #18-3: Day 1 field setting was extremely dry and significant dust was created by vehicles passing through the sampling area on an adjacent access road. Day 2 conditions featured the same soil moisture conditions but overall dust levels were lower since this site did not have an access road.



- FCO # 19-1: Scheduled maintenance work was less than 1,000 feet in length. Therefore, worker ABS sampling period limited compared to Day 1 and Day 2 sampling. Modified sampling plan to suit shortened maintenance length and duration.
- FCO # 22-1: The SAP called for a suspension of work during precipitation events. The SAP was modified to continue sampling during the light to moderate rainfall event that occurred this day.

Since the FCOs represent actual field conditions, these deviations will likely be incorporated into future ABS events and SAP revisions.

#### 5.3 Worker Air Sampling

The breathing space air quality of BNSF personnel involved with railroad maintenance was evaluated with personal air sampling techniques as described below. All personal air samples were collected using the equipment and procedures described in Section 3.3.1. The collection locations of personal air samples are not depicted on Figures 4-10 since the sampled personnel were not stationary.

Two personal air samples were collected each work day to evaluate potential exposure of BNSF maintenance workers to fiber releases. A total of 14 samples were collected during the ABS event. The samples were split between machine operator and laborer positions within the gang. All laborer positions were exposed to the ambient air and sampling of machine operators was biased towards machines that did not have fully enclosed cabs. Since maintenance work could not be interrupted, the sampling period lasted the duration of the working shift.

Blank air samples were collected throughout the ABS event. The blanks are applicable to air samples collected under both the Worker and Public Receptor SAPs.

#### 5.4 Sample Identification Numbers

All samples were assigned a unique sample identification consisting of a prefix followed by a five digit number that signify the order in which the samples were collected. All sample identifications were pre-assigned by CDM. Air samples were designated by a BA prefix (i.e. BA-00001) and the location IDs AD-005568.



#### 6.0 SAMPLING SUMMARY

The following is a discussion of the work areas and daily sampling activities that occurred during the ABS event. The following discussion contains gaps in the personal air sampling numbering since additional samples were collected during the Public Receptor portion of the ABS event. The results of the Public Receptor sampling are discussed under separate cover in the *Activity Based Sampling Summary Report – Public Receptors* (EMR, 2010).

#### 6.1 September 17, 2008

Sampling focused on RP-15 that was relaying approximately 2,000 feet of rail on wood ties at MP 1312, approximately 7.5 miles east of Libby (Figure 3). The following samples were collected (Table 1):

- Two (2) worker personal air samples BA-00001 and BA-00002 collected from a BNSF laborer and machine operator, respectively; and
- One (1) air sample blank BA-00010.

#### 6.2 September 18, 2008

Sampling focused on RP-15 that was replacing approximately 2,900 feet of rail on wooden ties at Kootenai Falls Siding (MP 1331.5). This work site was approximately 12½ miles west of Libby (Figure 3). The following samples were collected:

- Two (2) worker personal air samples BA-00011 and BA-00012 collected from a BNSF machine operator and laborer, respectively; and
- One (1) air sample blank BA-00020.

#### 6.3 September 19, 2008

Sampling focused on RP-15 that replaced 610 feet of rail on wooden ties at Kootenai Falls Siding (MP 1331). This work site was approximately 12 miles west of Libby (Figure 3). The following samples were collected:

- Two (2) worker personal air samples BA-00021 and BA-00022 collected from a BNSF laborer and machine operator, respectively; and
- One (1) air sample blank BA-00027.

#### 6.4 September 22, 2008

Sampling focused on RP-15 that replaced 1,400 feet of rail on wooden ties east of Kootenai Falls Siding (MP 1329.5). This work site was approximately 10 miles west of Libby (Figure 3). The following samples were collected:



- Two (2) worker personal air samples BA-00029 and BA-00030 collected from a BNSF laborer and machine operator, respectively; and
- One (1) air sample blank BA-00036.

#### 6.5 September 23, 2008

Sampling focused on RP-21 that replaced 1,000 feet of rail on concrete ties at the east end of Troy (MP 1337). This work site was approximately 1 mile east of Troy (Figure 3). The following samples were collected:

- Two (2) worker personal air samples BA-00037 and BA-00038 collected from a BNSF laborer and machine operator, respectively; and
- One (1) air sample blank BA-00046.

#### 6.6 September 24, 2008

Sampling focused on RP-21 that replaced 1,300 feet of rail on concrete ties at the east end of the BNSF Troy yard (MP 1339.5). This work site was approximately 1.5 miles west of Troy (Figure 3). The following samples were collected:

- Two (2) worker personal air samples BA-00047 and BA-00048 collected from a BNSF laborer and machine operator, respectively; and
- Two (2) air sample blanks BA-00056 and BA-00057.

This project completed RP-21's work within OU6.

#### 6.7 September 25, 2008

Sampling focused on RP-15 that replaced 600 feet of rail on wooden ties east of the Troy (MP 1341). This work site was approximately 3.6 miles west of Troy (Figure 3). The following samples were collected:

- Two (2) worker personal air samples BA-00058 and BA-00059 collected from a BNSF laborer and machine operator, respectively; and
- One (1) air sample blank BA-00069.

This project completed RP-15's work within OU6.



## 7.0 DISCUSSION OF RESULTS

Worker air sample results are discussed below and summarized in Table 1. Complete laboratory reports and chain of custody forms are found in Appendix D.

#### 7.1 Worker Personnel Air Sampling Results

A total of 14 worker personal air samples were collected during the ABS event. All samples were submitted for analysis via ISO 10312. Analytical sensitivity ranged from 0.00211 structures per cubic centimeter (s/cc) to 0.00769 s/cc. All but three 3 samples (BA-00002, BA-00037, and BA-000038) met the target analytical sensitivity of 0.0024. All samples were non-detect for LA, Other Amphibole (OA) and Chrysotile (Table 1).

#### 7.2 Air Sample Blank Results

A total of 8 blank samples were collected and submitted for analysis. Three of the blanks were not analyzed at the discretion of EMSL and were archived. All of the blanks were non-detect (Table 1).



#### 8.0 REFERENCES

AECOM, 2008a, Rail Maintenance Worker Receptor Activity-Based Sampling and Analysis Plan - Operable Unit 6. October, 2008

AECOM, 2008b, Rail Maintenance Public Receptor Activity-Based Sampling and Analysis Plan - Operable Unit 6. September, 2008.

EMR, 2008, Health and Safety Plan – BNSF Maintenance of Way Activity Based Sampling, Libby, Montana. September, 2008.

EMR, 2010, Activity Based Sampling Summary Report – Public Receptors. March, 2010.



#### 9.0 STANDARD OF CARE

The data generated and conclusions provided are based upon the scope of work performed. All work was conducted in a manner consistent with customary principles in the fields of science and engineering. EMR is not responsible for the independent conclusions, opinions, or recommendations made by others based on the data presented in this report. No other warranty, expressed or implied, is made.

The results reported and any opinions reached by EMR are for the benefit of the client and unless agreed to by EMR in writing, are not to be disclosed to or relied upon by any third party. The results and opinions set forth by EMR in this report will be valid as of the date of the report. EMR assumes no obligation to advise you of any changes that may later be brought to our attention.

EMR, Inc., as environmental consultants, respectfully submits this report.

The preceding report was prepared and reviewed by the following EMR personnel.

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March 12, 2010

March 12, 2010

Date

Date



# **TABLES**

## Table 1. Summary of ABS Air Sampling Results

#### Activity Based Sampling Summary Report - Worker Receptor BNSF RP-15/RP-21

#### BNSF Kootenai River Subdivision September 17-25, 2008

EMR Project #5539-120

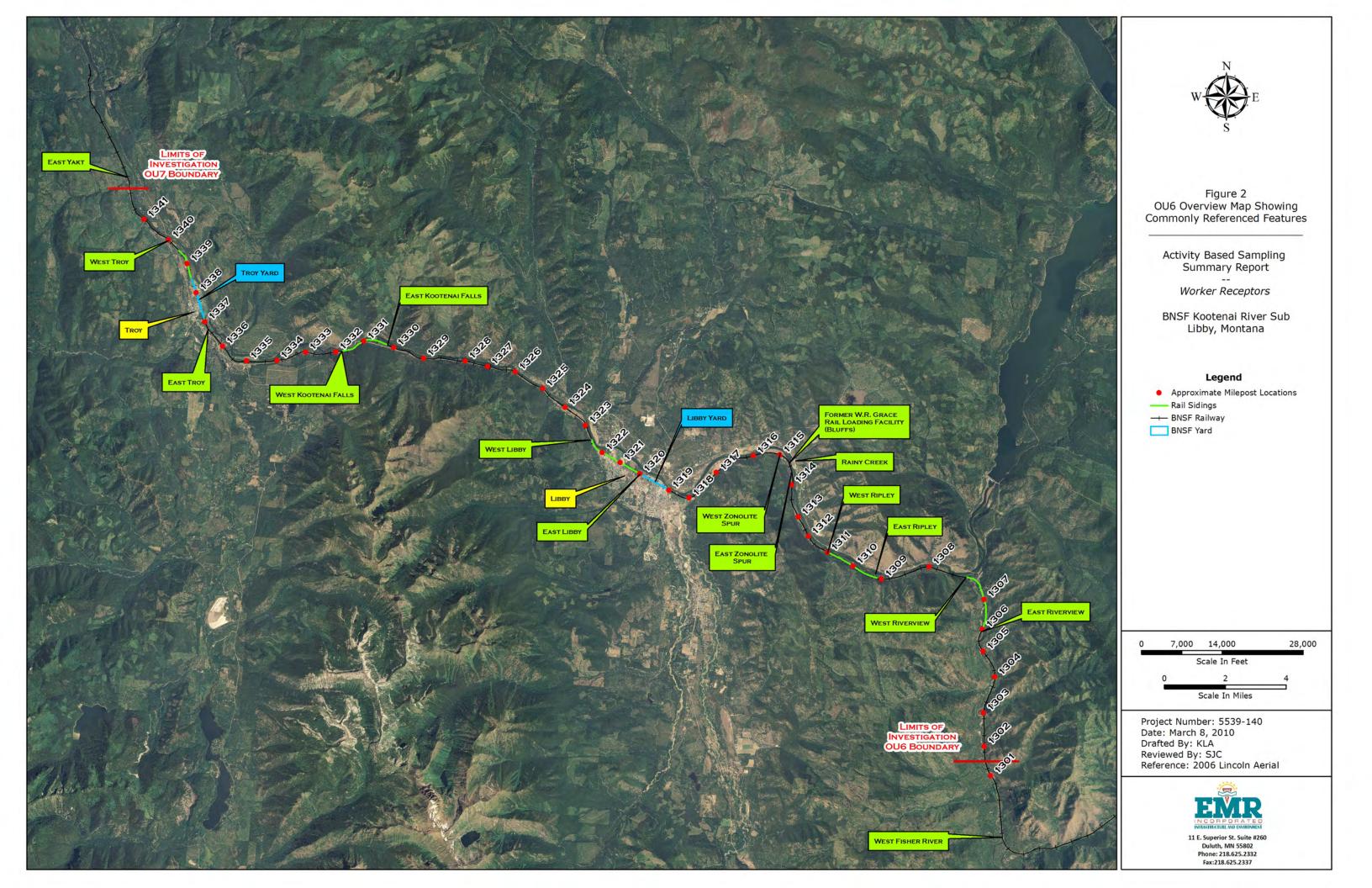
Index	Sample	Sample	Analysis	Sample	Volume	Sensitivity	Libby	Other	Chrysotile	Personnel	Job	Milepost
ID	Group	Date	Date	Type	(L)			Amphibole	s/cc	Name		
							s/cc	s/cc				
BA-00001	Property	9/17/2008	4/16/2009	Worker	1344	0.00211	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1312</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1312</td></dl<></td></dl<>	<dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1312</td></dl<>	Eric Pavlack	Laborer	1312
BA-00002	Property	9/17/2008	4/16/2009	Worker	1333	0.00426	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Victor Bachmeier</td><td>Cribber Operator</td><td>1312</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Victor Bachmeier</td><td>Cribber Operator</td><td>1312</td></dl<></td></dl<>	<dl< td=""><td>Victor Bachmeier</td><td>Cribber Operator</td><td>1312</td></dl<>	Victor Bachmeier	Cribber Operator	1312
BA-00010	Blank	9/17/2008	10/31/2008	Blank	0	Blank	0	0	0	NA	NA	1312
BA-00011	Property	9/18/2008	4/16/2009	Worker	706	0.00233	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Victor Bachmeier</td><td>Cribber Operator</td><td>1331.5</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Victor Bachmeier</td><td>Cribber Operator</td><td>1331.5</td></dl<></td></dl<>	<dl< td=""><td>Victor Bachmeier</td><td>Cribber Operator</td><td>1331.5</td></dl<>	Victor Bachmeier	Cribber Operator	1331.5
BA-00012	Property	9/18/2008	4/16/2009	Worker	687	0.00239	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1331.5</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1331.5</td></dl<></td></dl<>	<dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1331.5</td></dl<>	Eric Pavlack	Laborer	1331.5
BA-00020	Blank	9/18/2008	10/31/2008	Blank	0	Blank	0	0	0	NA	NA	1331.5
BA-00021	Property	9/19/2008	4/16/2009	Worker	988	0.00231	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1331</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1331</td></dl<></td></dl<>	<dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1331</td></dl<>	Eric Pavlack	Laborer	1331
BA-00022	Property	9/19/2008	4/17/2009	Worker	1016	0.00224	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Victor Bachmeier</td><td>Cribber Operator</td><td>1331</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Victor Bachmeier</td><td>Cribber Operator</td><td>1331</td></dl<></td></dl<>	<dl< td=""><td>Victor Bachmeier</td><td>Cribber Operator</td><td>1331</td></dl<>	Victor Bachmeier	Cribber Operator	1331
BA-00027	Blank	9/19/2008	10/31/2008	Blank	0	Blank	0	0	0	NA	NA	1331
BA-00029	AD-005568	9/22/2008	4/17/2009	Worker	1145	0.00235	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1329.8</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1329.8</td></dl<></td></dl<>	<dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1329.8</td></dl<>	Eric Pavlack	Laborer	1329.8
BA-00030	AD-005568	9/22/2008	4/17/2009	Worker	1145	0.00235	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Victor Bachmeier</td><td>Cribber Operator</td><td>1329.8</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Victor Bachmeier</td><td>Cribber Operator</td><td>1329.8</td></dl<></td></dl<>	<dl< td=""><td>Victor Bachmeier</td><td>Cribber Operator</td><td>1329.8</td></dl<>	Victor Bachmeier	Cribber Operator	1329.8
BA-00036	Blank	9/22/2008	Archived	Blank	0	Blank	0	0	0	NA	NA	1329.8
BA-00037	AD-005568	9/23/2008	4/17/2009	Worker	739	0.00769	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Matt Stashick</td><td>Laborer</td><td>1337</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Matt Stashick</td><td>Laborer</td><td>1337</td></dl<></td></dl<>	<dl< td=""><td>Matt Stashick</td><td>Laborer</td><td>1337</td></dl<>	Matt Stashick	Laborer	1337
BA-00038	AD-005568	9/23/2008	4/17/2009	Worker	890	0.00319	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Dale Johnson</td><td>Cribber Operator</td><td>1337</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Dale Johnson</td><td>Cribber Operator</td><td>1337</td></dl<></td></dl<>	<dl< td=""><td>Dale Johnson</td><td>Cribber Operator</td><td>1337</td></dl<>	Dale Johnson	Cribber Operator	1337
BA-00046	AD-005568	9/23/2008	Archived	Blank	-	-	-	-		NA	NA	1337
BA-00047	AD-005568	9/24/2008	4/17/2009	Worker	1154	0.00233	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Matt Stashick</td><td>Laborer</td><td>1339.5</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Matt Stashick</td><td>Laborer</td><td>1339.5</td></dl<></td></dl<>	<dl< td=""><td>Matt Stashick</td><td>Laborer</td><td>1339.5</td></dl<>	Matt Stashick	Laborer	1339.5
BA-00048	AD-005568	9/24/2008	4/17/2009	Worker	1165	0.00231	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Karl Harms</td><td>Clip Remover Machine</td><td>1339.5</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Karl Harms</td><td>Clip Remover Machine</td><td>1339.5</td></dl<></td></dl<>	<dl< td=""><td>Karl Harms</td><td>Clip Remover Machine</td><td>1339.5</td></dl<>	Karl Harms	Clip Remover Machine	1339.5
BA-00056	AD-005568	9/24/2008	Archived	Blank	0	-	-	-	-	NA	NA	1339.5
BA-00057	AD-005568	9/24/2008	Archived	Blank	0	-	-	-	-	NA	NA	1339.5
BA-00058	AD-005568	9/25/2008	4/17/2009	Worker	510	0.00232	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1341</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1341</td></dl<></td></dl<>	<dl< td=""><td>Eric Pavlack</td><td>Laborer</td><td>1341</td></dl<>	Eric Pavlack	Laborer	1341
BA-00059	AD-005568	9/25/2008	4/17/2009	Worker	501	0.00236	<dl< td=""><td><dl< td=""><td><dl< td=""><td>Bryce Vandenberg</td><td>Scrap Crane Operator</td><td>1341</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>Bryce Vandenberg</td><td>Scrap Crane Operator</td><td>1341</td></dl<></td></dl<>	<dl< td=""><td>Bryce Vandenberg</td><td>Scrap Crane Operator</td><td>1341</td></dl<>	Bryce Vandenberg	Scrap Crane Operator	1341
BA-00069	AD-005568	9/25/2008	11/6/2008	Blank	0	Blank	0	0	0	NA	NA	1341

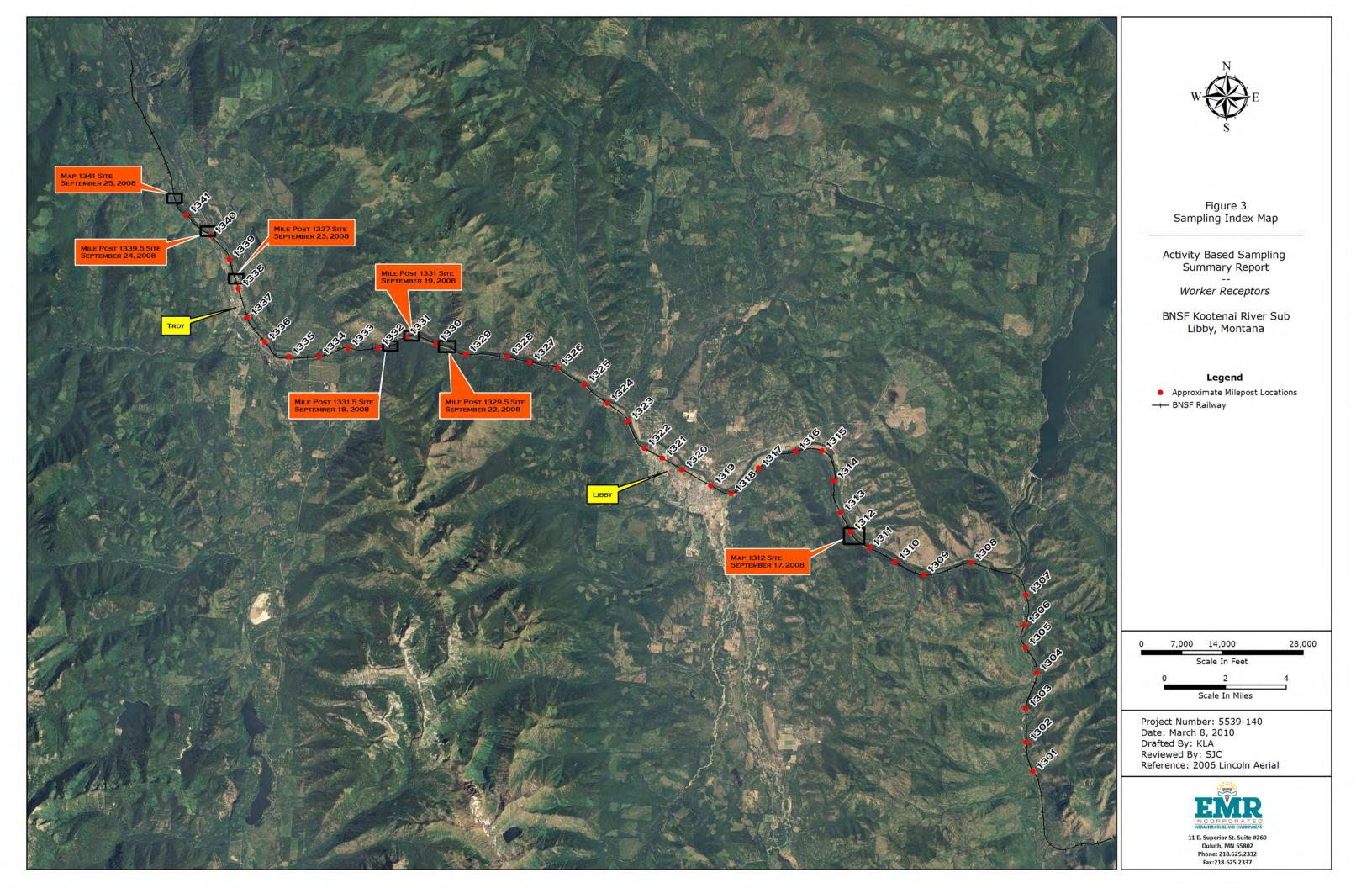
NA - Not Applicable DL - Detection Limits



# **FIGURES**









## **APPENDIX A**

**ANALYTICAL SUMMARIES** 

#### SAP ANALYTICAL SUMMARY # OU6RR1008 SUMMARY OF PREPARATION AND ANALYTICAL REQUIREMENTS FOR ASBESTOS

SAP Title: Rail Maintenance Worker Activity-Based Sampling and Analysis Plan

**SAP Date (Revision):** TBD

**EPA Technical Advisor:** Rebecca Thomas

(contact to advise on DQOs of SAP related to preparation/analytical requirements)

Sampling Program Overview: This document is the Rail Maintenance Worker Activity-Based Sampling and Analysis Plan (SAP) for the collection and analysis of samples of outdoor air in the immediate vicinity of rail maintenance activities that may actively disturb outdoor soil on portions of BNSF Railway Company (BNSF) Right-of-Way (ROW), which is located within Operable Unit (OU) six of the Libby, Montana, Superfund Site. This SAP addresses worker receptors that may be exposed to asbestos in air as a result of BNSF rail maintenance activities. Potential exposures will be evaluated through the collection of personal air samples (to provide valuable information for scoping the RI/FS Work Plan for OU6). A total of 14 personal air samples will be collected.

**Index ID Prefix:** BA = Air

Medium-Specific TEM/PCM Preparation and Analytical Requirements for Field Samples:

			Preparation	Details		Analysis Details			
Medium Code	Medium, Sample Type	Investigative? (a)	With Ashing (b)	without Ashing (b)	Filter Archive? (b)	Method(s)	Recording Rules	Analytical Sensitivity/ Stopping Rules	Applicable Laboratory Modifications (c)
A	Outdoor ABS Worker Air Samples	Yes	Yes Based on Analyst's Judgement	No	Yes	TEM ISO 10312	All Asbestos structures counted; L: ≥0.5µm AR: ≥3:1	Count until 1 is achieved: i) Target S = 0.0001 cc- 1(d), ii) 50 LA found, or iii) 0.5 mm <sup>2</sup> of filter is evaluated	LB-000016, LB-000016a, LB-000019, LB-000028, LB-000029, LB-000029a, LB-000029b, LB-000030, LB-0000031, LB-000031a, LB-000045, LB-000053, LB-000066, LB-000084, LB-000085

- (a) See LB-000053 for additional details
- (b) See most current version of EPA-LIBBY-08 for preparation details
- (c) Use most recent versions of listed modifications
- (d) Target sensitivity is set at 0.0001 cc-1; however, according to the Field Change Order (FCO) #17-1 (attached), sensitivity was adjusted to 0.0024 cc-1.

Requirements Revision #: 0 Effective Date: September 17, 2008

TEM/PCM Preparation and Analytical Requirements for Quality Control Samples:

	•	Preparation Details			Analysis Details			Applicable Laboratory	
Medium Code	Medium, Sample Type	With Ashing (b)	t Prep? Without Ashing (b)	Filter Archive? (b)	Method(s)	Recording Rules	Stopping Rules	Modifications (c)	
В	Field Blank	No	No	Yes	TEM ISO 10312	All Asbestos structures counted; L: ≥0.5µm AR: ≥3:1	Count until 0.1 mm <sup>2</sup> of filter is evaluated	LB-000016, LB-000016a, LB-000019, LB-000028, LB-000029, LB-000029a, LB-000029b, LB-000030, LB-0000031, LB-000031a, LB-000045, LB-000053, LB-000066, LB-000084, LB-000085	
С	Lot Blank	No	No	Yes	TEM ISO 10312	All Asbestos structures counted; L: ≥0.5µm AR: ≥3:1	Count until 0.1 mm <sup>2</sup> of filter is evaluated	LB-000016, LB-000016a, LB-000019, LB-000028, LB-000029, LB-000029a, LB-000029b, LB-000030, LB-0000031, LB-000031a, LB-000045, LB-000053, LB-000066, LB-000084, LB-000085	

<sup>(</sup>d) Target sensitivity is set at 0.0001 cc-1; however, according to the Field Change Order (FCO) #17-1 (attached), sensitivity was adjusted to 0.0024 cc-1.

**PLM Preparation and Analytical Requirements:** 

Medium Code	Medium, Sample Type	Preparation Method	Analysis Method	Applicable Laboratory Modifications

#### **Laboratory Quality Control Frequencies:**

TEM: Lab Blank – 4% Recount Same – 1% PLM: Lab Duplicate – \_\_\_\_%
Interlab – \_\_\_\_%

Recount Different – 2.5% Verified Analysis – 1% Repreparation – 1%

Interlab – 0.5%

#### **Requirements Revision:**

# SAP Analytical Summary # **OU6RR1008** Requirements Revision #: 0

Effective Date: September	17,	2008
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Revision #:	Effective Date:	Revision Description		
Analytical Lab	oratory Review Sign	<u>-off:</u>		
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- 0	the box and initialin	g above indicates that the laboratory has rev	viewed and acknowledged the prepara	ration and analytical requirements associated



# APPENDIX B

FIELD NOTES

LIBBY, MT & TROY, MT BASF RAIL MAINTENANCE ACTIVITY BASED SAMPLING (ABG FIELD COOK #1 START DATE 09-17-08 ALL-WEATHER **ENVIRONMENTAL** No. 550

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Location MP 1312

Project / Client BNSP

DAVE WELCH COLLECTS 3 FINGBRS HIGH FULL OF SOIL IN A ONE GALLON ZIPLOCE BAG FOR SAMPLING ANAWSIS MATT LENZ TAILES GPS LOCATION OF SAMPLE POINT (SP) 1 1048 RR- 00002 SOIL SAMPLE 2 IS TAKEN 8HEFT#0059ZZ SP- 138461 1048 MATT LENZ TAKES GPS LOCATION OF SP2 LOWAMOUNT OF VERMICUEITE (VISUA) 1049 FOUND IN SOIL 1057 SOIL SAMPLE #3 RR- 00003 15 TAKEN SHBBT \$005922 SP- 138462 LOW AMOUNT OF TA FOUND 1057 MOSTLY DISSEMINATED (057 MATT LENZ THEES GPS COCATION OF SP#3

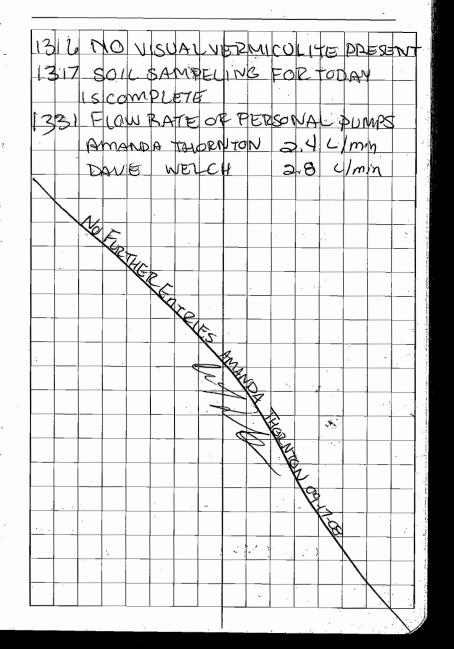
1105 SOIL SAMPLE RR- 00004 #415 TAKEN SHEET 4005923 SP- 138463 1105 LOW AMOUNT OF WERMICULTE POUND IN SOIL (MOSTLY NISSEMANATED) MATT LENZ TAKES EPS LOCATION MOS OF SP#4 SOIL SAMPLE 45 1113 RR- 00005 15 TAKEN SHEET 4005923 SP- 138464 1113 LOW AMOUNT OF VERMICULITECUSUAL FOUND IN SOIL (MOSTLY DESSIMANATED PLOT OF COALINTHE VICINITY 1413 MATTLENS TAKES GD SLOCATION OP SP #5 SOIC SAMPLE # 6 1122 RR- 00006 15 TAKEN SHEET # 005923 SP- 138465 NOANET MICOLITE FOUND IN SOLE 1172 VISUAL 1177 MATT LENZ TAKES GPS LOCATION OF SPHE

1138 SOIL SAMPLE 48 RR- 00008 IS TAKEN SHEET # 005924 SP- 138467 NO VISUAL VERMICULITE FOUND 1138 1138 MATT LENZ TAKES GPS LOCATION OF SP#8 1147 SOIL SAMPLE #9 RR- 00009 IS TAKEN SHEET \$ 005924 SP- 138468 147 LOW AMOUNT OF VISUAL UTIMICULITE ENCOUNTERED 1147 SP#9

SOLSAMPLE #10 IS TAKEN SHEET#OOS925 USG LOW AMOUNT OF VISUAL VERMICULITE ISTO MATT LENE TAILES GRS LOCATION OF SP #10 1204 SOIL SAMPLE RR-00011 # (115 TAKEN SHEET #005925 SP- 138470 1204 LOW AMOUNT DE VISUAL VERMICULITE ENCOUNTERED 1204 MATT LENZ TAKES GISLOCATION OF SP# SOIL SAMPLE #12 1214 RR-00012 IS TAKEN-8HEET #055925 SP- 138471 MATTLENZ TAKES GPS LOCATION OF 1214 LOW AMOUNT OF VISUAL VETENICULITE ENCOUNTERED 1214 MATT LENZ TAKES A GPS COCATION

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Project / Client BNSF		



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Location MP 1331.5 Date 09-18-08 19
Project / Client BNSF

1118 SOIL SAMPLE #18 RR-00018 (S TAIGEN SMEET 405927 SP- 138477 1120 ACTUAL TRESSPASSETS ON SITE OLD MAN & LADY FISHING W-NOONS-08 2 SCHNOWSERS NO UV SEEN 1120 RR- 00019 SOIL SAMPLE # 19 15 TAKEN SP- 138478 SHEET#006/01 NO UN ENCOUNTERED 1142 NOTEL: 18 MIN TIME SPAN BETWEEN SAMPLES 18 & 19 WERE DUE TO HAVING TO RETRIEVE FIELD SUPPLIES FROM TRUCK 6 SPEAKING WITH TRUSSPASETES RR-00020 1152 SOIL SAMPLE 120 (STAKEN SP- 138479 SHEET#1006/01 1152 LOW ANOUNT OF VV SEEN DISSEMINATEDY

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1312 GPS POINT TAKEN OF SAMPLE #23.

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Project / Client	BNSP			

1313 GPS LOCATION TAKEN OF SOIL SAMPLE 422 1314 & PS LOCATION TAKEN OF SOIL SAMPLE #DI 1.315 GPS LOCATION TAKEN OF SOIL SAMPLE +DO 1316 GPS GOCATION TAKEN OF SOIL SAMPLE +19 675 LOCATION TAKEN OF SOIL SAMPLE 418 GPS LOCATION TAKENDESOIL SAMPLE #1 1318 6PS LONATION TAKEN OF SOIL SAMPLE #18 ALLOPS LOCATION WERE TAKEN BY MATT LENZ OF EMR BNSF TRAIN PASSED BY WORTH BOUND 1417 2 TRESPASSERS CROSS TRACKS TO GO #15HING FOR SAUMON 1600 DAREMISES

Location MP 1330.5 1331 Date 09-19-08

Project / Client BNST

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Project / Client BNSF

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0935 SOIL SAMPLE 00025 GPS LOCATION

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Location MP 1329, 8

Project / Client \_\_BNSF

9/22/08

Date 09-22-08 27

Project / Client BNSF

DAVE WELCH ST AMANDA THORNOON APRIVE ON 0535 SITE CEMPTONESS) WEATHER 509 GRAINING, ALSO RAINED LAST NIGHT. 9 (108) O **6**00 ESS KOOTENAL BALLS & WSG Y COTENAL 0600 FAUS. 1010' FRIDAY 1120' 81400' TODAY 1120 WOOD 10 ( V 153 1 1327 1400' CV 12392 13294 1200 TIME TRACEPROTECTION BUSE SPERTY MET PLNC 0000 MAIN LINE IS LUB AMTRAK WBST -BOUND. ALL PUMPS SET TO 28 //MN. N075 SAMPLE# START TIME NAME 55N' DOB RYAN TUCKER 3932 LABORDE 27 0621 MARKE-CKSTROM 4489 LABORER 0624 0626 COLREY CHIRISTIC 7073 LABORER 29 0629 JOSH SYNNOT | 8473 LARDEER BRYCE VANDENBOXE LADS MELLINE 0633 MIKE COSSAIRT 8354 MACHINE 0636 EMP & BUST LEAVE POR WORL AREA BUSE WILL MEET EMP AT MP 1329.8

0939 WEATHER STATION UP & BUNNING TEMP SUP WIND SPEED VARIBLE BETWEEN 7.8 MPH 8> 60 MPH BA . 00031 MATTUNZ 0941 0941 BA-dod 3 D AMANDA THORNTON 0947 DAVE WELCH BY DOHN STARR AREIN THE PROCESS OF BETTING UP PERIMETER 1009 DAY WEICH I ELT TO MAKE A PHONE TO CLAIR IFY BNSF DIRECTIONS DAVE WELCH RETURNS TO MP1324 1021 NOTE TROODMASTER WAS NOT CLEAR ON HE WHITEPOARD OR VERRALLY WHERE THEIR WORK ZONE HOULD RE TODAY. 1025 FMR BROLL DOWN GOURNENT & WENT TO MP 1829.8 1040 EMRARRIVAN AT MP13198 1043 WEATHER STATION UPERLYMING 1044 PERINETED PUMPSBETNG SETUP 1100 SOL SAMPLE ALOTS SET UP

Date 9-22-08 29 Location MP 1329. 8 Project / Client BNSF 1138 501L 15 VERY WET SOIL SAMPLIS 1143 RR- 00035 53\$18 TAYEUN SHEET # OOLLO SP- 138494 NO UN SEEN SOIL SAMPILE 1150 RR- 00036 36 ISTAKEN SHEET 4006/06 SP- 138495

1150 LOW AMOUNT OF DISCHMINATER

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SOILSAMPLE #39

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SP- 138497

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WIND SPEED a GMPH

Location MP 1337B TROYPAIL APP Date 9-3308

Project / Client BNST

0936 SOIL SAMPLE 445 RR- 00045 ISTAILEN SHEET# 006110 SP- 138504 TEXTURE IS SAME AS BEFORE LOW AMOUNT OF VUSICIEN 0936 SOLL SAMPLE # 410 0947 RR- 00046 13 TAKEN SHUET # 006110 SP- 138505 LOW AMOUNT OF MSEEN 0947 MEDIUM AMOUNT OF VV SEEN GPS OF SOIL SAMPLY #39 + AKEN 1000 wio GPS OF SOIL SAMPLE # 40 TALEN GPS OF SOIL SAMPLE #41 TAKEN 610 GPS OF SOIL SAMPLE #42 TIAKON 1015 GPS OF SOIL SAMPLE #43 TAKEN 1017 GPS OF SOIL SAMPLE #44 TAKEN 91019 1021 EPSCR SCIL SAMPLETUS TAKEN 1025 GPSOF SOIL SAMPLE # 46 TAKEN STOU NOW THAT THE SUN 15 OUT & FOR HAS CLEARED WE SEENVENERY WHERE! 1022 GENERATOR FOR STATION ARY PUMPS ON SOUTH TRACKS WENT DEAD. SAMPLES NOT SUBMITTED.

NOTE OF MAJOR CONCERN ROADMASTER OF RP-21 WAS TOID BY DAVE WELCH OFEMP THAT IT WOULD BE ADVISEABLE TO MAVE HIS WORKERS WEAR RESPIRATORS, BASED ON THE SITE HISTORY OF THE TROY RAIL YARD. HIS WORKERS WERE NOT EVEN INTERMED THAT THERE WAS A THREAT. THE WORVERS AT I FAST DESEATURE THE INTERMATION TO MAKE A PERSONAL CHOICE ON WEATHER OR NOT TO DON A RESPIRATOR 1400 EMPLERT FOR COM le

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0550	EMPER	rplay Ex	SARE	AUCN	SITE
	OUTFIT	BNS E	MP LOYE	ES WITH	4
	i				
Class	BNST S	SAFETY	MEET 1	VS CON	MENCES
	TODAY	EMAW	ILL MEZ	TRP-2	IAT
	SIDE	LEPT R	ALL MF	1329,5	1300
· 					
	ACCES	S-HW	Y2 Cw	1 R16+	ITON
	HUNTS	MILLR	D HOO	10 TH	E LEFT.
OSHA					·
STARKE					SAMPLE
0622	DALE J	OHNSON	5315	ASSISTANC FORDMAN	43
0624	1			DECLIPPER	44
0625	C5 CA	WEN	1405	LABOR	1 7 S
0627	BENRO	BERTSON	5372	PORUMAN	46
	FODD-	W 979-	08		
0629	AR THUR	MUKE	2450 mg	DATAMOR	47
0631	DANIGIT	ODRIQUE	2.8874	OPPLATOR	48
0659	EMR 5	AFEYY W	reen	6	
	1 1	-	-		FOULD E
	LEVEL	C PPE			_
	HOCK	BBER	TODAY	(CONCRE	TE).
	05HA 57HA 0622 0624 0625 0627 0629 0631	ALVO S OUTFIT PERSON PERSON PERSON SIDE TIE U ACCES HUNTS ~2-5 OSHA FOR TH OLDAY OLD	AND SETTING OUTFIT BASE & PERSONAL PUI OLOD BNST SAFETY TODAY EMP W 200 JOB SITE SIDE LEPT R TIE UP AT ACCESS - HW HUNTSMILL R ~2-5 NESTBO OSHA FOR THIS MORN THIS MORN THIS DALE JOHNSON OGAT BEN ROBELTSON TODD WI GROWE OGAT BEN ROBELTSON	AND SETTING UP ECO OUTFIT BASE EMPLOYE PERSONAL PUMPS.  CLOOD BASE SAFETY MEET IN TODAY EMPLUIL MEET  2nd JOB SITE AT C  SIDE LEPTRAIL ME TIE UP AT YAKT, M ACCESS - HWY 2 CW HUNTSMILLED HOOK ~2-5 NESTBOUND TRE  OSHA FOR THIS MORNING.  THE DAME SSN  OLDA DAME SSN  OLDA DON CROW SYSL  OLDA COME SYSL  OLDA COME SYSL  OLDA CROW SYSL  OL	AND SETTING UP EQUIPMED OUTFIT BASE EMPLOYEES WITH PERSONAL PUMPS.  CROSS BASE SAFETY MEETING CONTODAY EMPLOYEES WITH MEET RP-2  2rd JOB SITE AT CV 1339  SIDE LEPTRAIL MP 1339.5  TIE UP AT YAKT, MP 1349.6  HUNTSMILLED HOOK TO THE  -2-5 NESTBOUND TRAINS TO  OSHA FOR THIS MORNING.  STARTE NAME SSN JOB  OBJA JOHNSON 5315 FORDMAN  OBJA JODY CROWS 5426 DECUPPED  OBJA CROWN 1405 LABOUER  OBJA DANIE TORKOUST 8877 ORLAND  OBJA DANIE TORKOUST 8877 ORLAND  OBJA DANIE TORKOUST 8877 ORLAND  OBJA CAMPLING ACTIVITIES OF

OBST WEATHER STATION UP BRUNNING	
	- 1
WIND SPEED DIGMPH	_
FOGGY BUT THE SIN IS COMMING	3
THROUGH A 11TTLE BIT.	
0907 PERIMETER PUMPS UP AND RUNNIN	<u>s</u>
NOTE DEFUNKED GENERATOR IS NOW	
NORKING AGAIN AFTER REPAIR	ے
AT RICKS RENTALINGERY, MT.	
0920 DAVE WELCHE PLOTS OUT SOIL	
SAMPLING LOCATIONS.	
0953 SOIL SAMPLING BEGINS	
0955 SOIL SAMPLE 44	7_
RR- 00047 15 TAKEN	
8HULT 4 00101	1
SP- 138506	
DESS NO VV STEN	
TEXTURE: CLAY/SILT/SAND WITH	
COARSE GRAVEL. HARDPACKED	
1002 SOK SAMPLE HE	3
RR- 00048	
SHEE7 # 006111	
SP- 138507	
1002 TEVTURE: SILTY SAND W/COLRSE	
GRAVEZ	

LOW Amoun TOF UNSEEN

1011

Location MP 1339.5

Project / Client BNST

1027	RR- 00051	-	SOIL		- 1	æ	<b>€</b> S	,
	SP- 138510	-	SHE		1	060	ໃລ	
	TEXTURE: SAME,			& 1 <u>.</u>	3 <i>0</i>	_		
1037	RR- 00052	[—] [	301L				₩S	2
	SP- 138511	ــ ا ـ ما	SHE	£7			,112	
1037	LOW AMOUNT OF			ΞŅ	me	re:	#5	~
	RR- 00053 SP- 138512	-	15 SHE	TAK	LEN	/		
1047	TEXTURE: SAME CANSEE UV ON LOW VV SEEN	Sy	RF ACE	0	F S	Pi		-
1102	RR- 00054		Sono 15 T	SI	CE	N		5 <i>\empty</i>
	SP- 138513	<del></del>			٠.			

6PS OF STATIONARY PUMP THEN BY-60055

 Location MP 1339.5
 Date 9-24-08

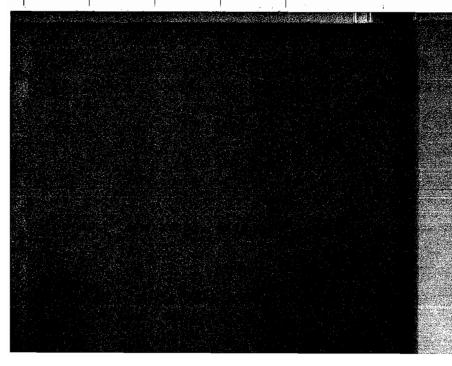
 Project / Client BNSF

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ect / Client \_BNSF

EMPEMPIONES ALL ARTINEAT TROY YARD THE UP TO MEET RP.15 GANG BUSE SPRETY MUETING COMMENCES 1341 LEFT HIRSA 600 THEN RP95 WILL BE OUT OF OUG. IBNST SAFETY MEETING COUCUDES STRETCHING BEGINS SAMPLE SOB SAMPLE 55N\* NAME JOSH SYNNOTY 8473 51 PYAN TUCKER 3932 LABORDA 52 machine MIKE COSSAIRT 8354 53 VICTOR BACHMER 2767 oper 54 RODNEY ZIMMERMU 3662 LABOTUR 55 9430 LAGEN COX ARCRER 56 EMP ARRIVES BY MP 1341 EMR SAFETY MEETING. LEVELD PPE 4 HOUR TRACKPROTECTION 0500-1000 WEATHER STATION UP& PUNNING. TOMP 49.8° 17 WINDSPEED O. GMPH PERIMETER PUMPS UBS RUNNING.

BINST CREW GUS ARRIVES 0730 0755 SOIL SAMPLE RR- 00056 56 ISTMEN SHEET HOOLOUS SP- 138515 0745 NO UN SEEN TEXTURE: SANDY SILT WEATHERD) ROCK (BALLAST 0803 SOIL SAMPLE #5715 TAKEN RR- 00057 SHEET # COILL SP- 138516 TEXTURE SAME AS AROW NO UV SEET 0803 SOIL SAMPLE 0812 RR- 00058 #58 ISTAKEN SHEET 4 0016115 SP- 138517 TEXTURE: SAME AS ABOUT 0812 NOW SERV 0822 SOILSAMPLE #59 RR- 00059 ISTAKEN SHEEK# 000116 SP- 138518



Location MP 134)	 Date 9-25-08	- 4 -
Project / Client BNSF		

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Libby, MT & Troy, MT
BNSF Roil Maintenance
Activity Based Sampling
Fieldbook # 2 (ABJ)
Start Date
07-17-08

"Lite in the Rain" ALL-WEATHER ENVIRONMENTAL No. 550



# ALL-WEATHER ENVIRONMENTAL FIELD BOOK

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This book is printed on "Rite in the Rain" All-Weather Writing Paper - A unique paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather. For best results, use a pencil or an all-weather pen.

Specifications for this book:

Page	Pattern *	Cover	Options
Left Page	Right Page	Polydura Cover	Fabrikoid Cover
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	CONTENTS				
PAGE	REFERENCE	DATE			
13	MP-1312 9/171				
وي	MP-1331.5	9/18/08			
9	MP-1331	9/19/08			
12	MP- 1329.8	7/22/08			
15	MR - 1337	9/23/08			
18	MP-1339.5	9/24/08			
21	MP- 1341	9125108			
<b>ચ</b> 4	Video Log				
	*				

### Reference Page Index

- 147 Error codes, Hazardous classifications, Container types
- 148 Sampling guidelines (Liquids)
- 149 Sampling guidelines (Solids)
- 150 Approximate Volume of Water in Casing or Hole, Ground Water Monitoring Well
- 151 PVC Pipe casing tables
- 152 Soil Classification
- 153 Soil Classification
- 54 Conversions (Length, Weight, Volume, Temp, etc...)
- 155 Conversions (Concentrations, Volume/Flow or Time, Velocity, Acceleration)
- 156 Maximum Concentration of Contaminants for the Toxicity Characteristic

CONTENTS							
PAGE	REFERENCE	DATE					
		-					
		N.					
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Location _	MP-1312	Date 9/17/08
		Date 17 . 77 C C

Project / Client \_ BNSF - ROW

0000: Arrive at BNSF salely needing 0630: Personal Pumps sharted for Suo) activity based samples a OSHA (six) 0700; EMR leaves safety neeting site to Ripley MP-1312. 0710: EMR holds talkate safety weeting. Begin selling up stationary purps 0730: Crenerator not working property Not enough power for south side Dumps 0735: Worth side pumps shorted 0747: Tresposser ABS samples shorted 0830! Scottearney heaves site to return generator 0850 M. lenz begins videotoping track manterence crew 0910 Scott C back on site with new gereato. 0915 Pumps on south side of track \* sharted 1035. Cribber passed flying areas 11441 Pumps cheek and roles unchanged Onlooker promp a ropped from 2.8

Location MP - 1312 Date 9/17/08 Location MP 1312 Date 9/17/08 Project/Client 3NSF ROW Project / Client BNSF-ROW 1200% Pumps checked and rates are **BA-00008** 7-61pw 1315 Anchor nachre passes pungs 1250: Stationary pumps emples collected SP- 138442 ML/ BA- 00009 0737 start 143-911/105 Tresposser sendes when 1.61pm ABS started 0636 2.81pm stopped 1436 2.81pm SP- 138443 BA- 00001 Blank BA- 00010 Stopped 1436 BA- 00002 0749 short 2.41 pm 16 BA- 00003 Start 0749 28 1pm BA- 00004 9/17/08 M1 BA- 00005 0753 short 2.8 1 pm ALMO BA- 00006 0911 start 7.6 1pm 1305 stop SP- 138440 1304 stop 7.61pm BA- 00007 SP- 138441

Location MP-1331,5

Date 9/18/08

Project / Client BNSF - ROW

BA- 00011 1502 stop 1.41pm BA- 00012 06418 Start 1.4 Lpm 1459 Step 10000 start BA- 00013 2.8 Lpm 1555 5 P , ract 2.8 1000 short Amainda stop 2.6 **BA-00014** 1555 36p storted 2.8 1015 start Hash stop 2.7 **BA-00015** 1556 slop Stationery 0958 Start 7.6 LAM BA- 00016 1550 stop 1 SP-138444 5958 short 7.6 LPM BA- 00017 1550 shop 5P-138445 short 1011 7.6 LPM **BA-00018** 1545 SP-138446 7.6LPM 1012 1544 slup BA- 00019 Blank **BA-00020** 

0600 salely neeting at crossments 0630 short actuary based sample 0700: offsite 0730 Arrive at MD 13345 5 hould occur, solely weeky 0745: EMR prepares from BUST Track personnel to reach Samply area 0900: BUSE worker approach 0930: Pumps (3 harbonary) stocked 0950: Trespasser pumps shorted 1015. Te pullers pass by 1030: speed swing a plate puller PASS 1100 5 star cheeks 5 Hattoners purps Flori Rates have not changed 1120: Tie plugger passes by 11301 Cribber passes by 1136 M. Cenz offsite to resolve GPS 155ue> 1219 Ray reset chare to the end of work aren 1st equipment to end Since Copper.

ML 1/19/68 Location MP-1330.5 1331 Date 9/19/08

Project / Client BWSF - ROW

Project / Client BNSF ~ Row

1300 M. Cent rehim and takes GPS coordinates of soul sample areas and slahonary pumps 1340 Reset come and welding truck stopped a have been for 30 minutes 1345 ABS pumps checked low Plani rabe Matts pump at 27 com Amardas pump at 2.4 Lpm Dares pump at 25 Lpm 1350: Train passes by 1400; ML GPS station 1540: Last of equipment passes 1545: Pull stationary samples 1556: Pull tresposser pumps emples Downloaded Met Data to Laptop 1615 appite 1630

CS45. Acre to BMF safety meeting 3648 shart BNST personal samples 0715 Train passes by 0120 stationary purps bet up and starter 0730 Trains have been passing on main work will begin shortly 0740 speed 3211/2 UTSU! tran passes on Main OFER: The pullers pass 5810: Worker withing rell OSIS EMR soil sampling 3 & location Cono: EMR Unisetapes work 0839: M. Lenz checker spersonal prings Dove o setts still at 28 484 LEA J. starr checks stationary pungs 0835 Rate never of siding 28 40 work has stopped due to inoperable weeking Reset come noves morerable nauther 0850 Siding The plugger pusses soil sample 0940 Pull reset stark passes. could welding that phisos

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<b>/ BA- 00022</b> -	+	100	7	15	31		.0		
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BA- 00023 	26	90							
BA- 00024	31	-1 100		648 241	3	٦.(	o L	۶M	
BA- 00025	<u></u>	90		<mark>ક્રમ</mark>		11	ه.	Lpv	~
BA- 00026		_							
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<sup>™</sup> BA- 00027	Blan	Ŀ						٠.	
BA- 00028		29	5	ta,	4	7	6	ما	<u>~</u>
SP- 138449	11	48	2	احا	-				

Location MP - 1331 7

Project / Client BNSF-Row

Amanda T. and Dave W. start sampling

Rail Reset chane passes by

Rain starts

soil. Run stopped

1120:

1130 :

1159:

<b>٣</b> ٦ Location	विध.	8

Date <u>912ス/08</u>

ML9/23/08

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1318. BNST DERS	wyr		, ,			١			
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BA- 00031 BA- 00032	5	top top	13	31 62 18 09 43 44 435	8 41	<u>ئ</u>	81	Ιρι	ન
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Location MP-1339.5	Date 9124108
Project / Client BNSF	

	my started at 0930
1015. Lead blow	er passes by cleaning
of concret	he ties visible dust.
1105. Gooper say	
1115: Weldy trul	
1120 Tunger pas	
	Dave Welch Pinished
Samplina s	
1 1 1 1 0	S GPS points at soil
	d ABS stationary samples
1155: The bomb	
	sol by workers
Machine De	allows and locks into
place	
1,24511111111	ment passes
1309: 3. Start == 0	bes do you've youd to take
1900 EMR ORSIL	000 000
	Table 1 Took of the last
F/ BA 000 12	STOP 1309 4.8 LPM
4.6	3 at 0619 2.8 Lpm
BA- 00048	Stop 1315
A KIS	start 0907 2.7 4pm
	5/1-0 10 10 10 10 10 10 10 10 10 10 10 10 10
BA- 00050	4 - 1 0 40 1 3.1 FOR
₩ BA- 00050	-2 to 2 1400 -

			١
Project / Client	BNSF		

Project / Client \_

0725 BA- 00067 7.6 2 pm 2000 5P-138463 co located sample **BA-00068** Start 0725 7.62pm 5P-138463 She p 1000 BNSF safely needing at Tray yard 0600 ABS samples sharted on BUSF workers 0620 Arme at MP-1341 shart Tresposees 0000 ABS samples. Set up weather station. safety reeding 0725 start stationary samples BA-00064 & BA-00068 are co-located samples 0730 EMR shorts soil sumply 0000 Chip supply passes to the west 0731 073 A 0738 Declipper passes 0745 speed swim pusses to east speed swin passes to west 0749 0757 Crew prepping tres 0805 Gooper passes 0824 fruk pasks

0848	Bomb,	5016	e>		
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Project / Client Video Log

Location

Video Log (cont.)

DiscTime 9117108 MP-1312 .Olser BNSF safety meeting 26 see Pumps (ABS) assigned to rail workers Air Moritorin Area 43 sec 1.00 min Spike puller 1.3 min 23min cribber Machine 3 min cribber passing Rail reset crane 4.20 min 6.36min Rell work 7.3 mm Line of machines 8.4 min Anchor machine 8.41 min magnet pulling spikes Par Scrap 9.3 min 50, sampless 9/18/08 2.1681-9M 9.41 Ray reset cram Tresposer start samply 10.4 360 Jiew sampling And 11.26 road work 1220 speed swinn Ballast being 1250 moved 1356 1404 Trespossers (real) on tracks

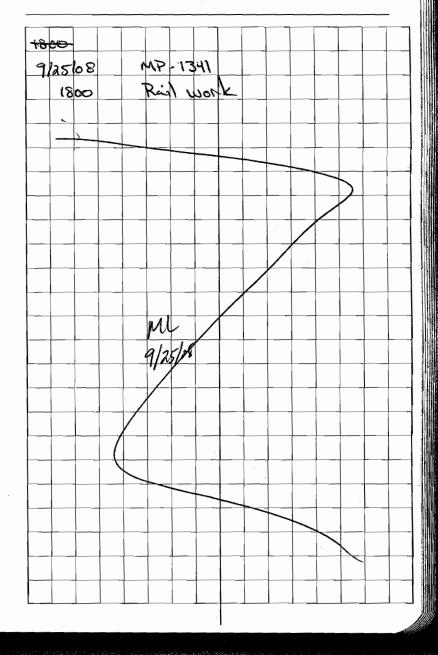
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Project / Client \_\_\_\_ Violes Log

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9/22/08 MP-1329.8 8.09 360° i.ev of samply Aver 9.10 Air sumples
9.30 Rul work 1000 Mile post location 9/23/08 MP- 1337 100) 360° of work Area 1030 spike puller 1130 (toopers applying adhesize 1140 Rail work 1200 The Bomb machine MP-1339.5 9 124/08 1230 Anchor pulled Dechyper 1300 360° of work area 1400 Goopers 1430 The bomb making 1450 workers putting dips on he 9/25/68 MP-1341 360° of work area 1500 1550 Declipper 1630 Rail work 1712 Soil samples 1730 rail reset chank 1740 The bolomb

Location	Date	
Project / Client		





### APPENDIX C

FIELD SAMPLING DATA SHEETS - AIR

Sheet No.: PA- <u>004867</u> R PERSONAL AIR

Field Logbook No: 🛳		SAMPLING DATE  Sampli	ite: 9/17/08
Address: BNSE			
∟and Use: Residen	tial School Commercia		Othery ROW )
Sampling   learn   GDI Person Sampled/Co	M Other <u>EMR</u> Names: Name: <u>ERIC PA</u> VLACE!	to the second second of the second	Task: <u>LABORER</u>
Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00001 /		
Location ID	AD-005568		1997 - 1997 - 1988 - 1988 - 1988 - 1988 - 1988 - 1988 - 1988 - 1988 - 1988 - 1988 - 1988 - 1988 - 1988 - 1988 -
Sample Group	Property	12 The State of the Control of the C	
Location Description	MP 1312.	<b>^</b>	
			TE VD (STANLE) ID (LENGT)
Category (circle)	FS) FB-(field blank). LB-(lot blank).	FS FB-(field blank) LB-(tot blank)	FS FB-(field blank) LB-(lot blank)
Matříx Type (circle)	Indoor Outdoor	Indoor Outdoor	
Filter Diameter (circle) Pore Size (circle)	25mm 37mm	25mm \ 37mm \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
	TEM: 45 (CM: 0.8)	TEM- 45 PCM- 0.8 NA 7	Rotometer DryCal NA
Flow Meter Type (circle)	(Kotometer) DryCal NA	NOIOMETEL DAVOERS 101	
Pump ID Number  Flow Meter ID No.	VFB-65	The state of the s	
Start Date	الارام م 9/17/08		
Start Time	0.36 B31345 Lune		
Start Flow (L/min)	2.6 Lpn 28 ML 1111/	1	eredapte per la company
Stop Date	9/17/08		
Stop:Time	143G	750 mg	
Stop Flow (L/min)	2.8		
Pump fault? (circle)	(III) Yes NA	No Yes /NA	NoYes NA
MET Station onsite?	No (Yes) NA	No Yes / NA	No Yes NA
Sample Type	TWA EXC (NA)	TWA EXC / NA	TWA EXC NA
Field Comments			
Cassette Lot			Property of the second
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes-/ No
Entered (LFO)	Volpe: Entered Validated	Volpe: Validated Validated	Volpe: Entered Validated

For Field Team Completion
(Provide Initials) M. Completed by QC by

#### Sheet No.: PA- **004868** LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR Field Logbook No: <u>550</u> Page No: <u>6</u> Sampling Date: 9/17/08 Address: BNSF ROW Owner/Tenant: BNSF Pusiness Name: \_\_\_\_*N*√A Other ( ROW Land Use: Residential School Commercial Mining Roadway Sampling Team: CDM Other EMR Names: Person Sampled/Co. Name: Victor Bachmeier | BNSF SSN: 2767 Task: CRIB OPERATOR

Data Item	Cassette 1	Cassette 2	Cassette 3	
Index ID	BA- 00002			
Location ID	AD-005568			
Sample Group	AD-005568 Property			
Location Description	MP 1312			
Category (circle)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)	
Matrix Type (circle)	Indoor Outdoor	Indoor Outdoor	Indoor Outdoor	
Filter Diameter (circle)	25mm 37mm	25mm 37mm	25mm 37mm	
Pore Size (circle)	TEM45 (PCM- 0.8)	TEM45 PCM- 0.8	TEM45 PCM- 0.8	
Flow Meter Type (circle)	Rotometer DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA	
Pump ID Number		·		
Flow Meter ID No.	UF8-65	· 		
Start Date	9/17/08 , 9/17/08			
Start Time	636 143/2			
Start Flow (L/min)	2.8/24 2.8	·		
Stop Date				
Stop Time	1452			
Stop Flow (L/min)	2.8	. ,		
Pump fault? (circle)	Ñ <del>o</del> Yes NA	No Yes NA	No Yes NA	
MET Station onsite?	No Yes NA	No Yes NA	No Yes NA	
Sample Type	TWA EXC MA	TWA EXC NA	TWA EXC NA	
Field Comments  Cassette Lot Number:	Archive Blank (circle): Yes No	Archive Plank (sirele): Ven Ne	Archivo Plank (circle): Vee No.	
Entered (LFO)	Volpe: Entered Validated	Archive Blank (circle): Yes No  Volpe: Entered Validated	Archive Blank (circle): Yes No  Volpe: Entered Validated	

For Field Team Completion	Completed by	QC by
(Provide Initials)	Completed by	GC by

Sheet No.: SA-008683

## LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR STATIONARY AIR

Field Logbook No: Address: BNSF	ROW Page No: _	Sampling D @wner/Tenant: _BNSF	ate: 9/17/08		
usiness Name.	VA				
Land Use: Residential School Commercial Mining Roadway Other (ROW ) Sampling Team: CDM Other Names:					
Data Item	Cassette 1	Cassette 2	Cassette 3		
Index ID	BA- 00010				
Location ID	Blank MINIMOS		)		
Sample Group	Property Blank	Property	Property		
Location Description	And the second second second second				
	Blank				
Category (circle)	FS FB (field blank)  LB-(lot blank) DB-(prep-dry blank)	FS FB-(field blank)  LB-(lot blank) DB-(prep-dry blank)	FB-(field blank)  LB-(lot blank) DB-(prep-dry blank)		
Matrix Type (circle)	Indoor Outdoor NA	Indoor Outdoor NA	Indoor Outdoor NA		
Filter Diameter (circle)	25mm 37mm (	25mm 37mm,	(25pam) 37mm		
Pore Size (circle)	TEM 45 PCM- 0.8	I manuficial (	TEM .45 PCM- 0.8		
GPS Status (circle)	Collected	Collected	Collected		
	Previously Collected	Previously Collected	Previously Collected		
	Not Collected-no signal (3 attempts) Not Collected-not required for sample)	Not Collected-no signal (3 attempts) Not Collected- not required for sample	Not Collected-no signal (3 attempts)  Not Collected- not required for sample		
GPS File (fill in or circle)	Filename: NA	Filename: NA	Filename: NA		
Flow Meter Type (circle)	Rotometer DryCal (NA)	Rotometer Dr/Cal NA	Rotometer DryCal NA		
Pump ID Number			·		
Flow Meter ID No.					
Start Date	W	· · · / · · · · · · · · · · · · · · · ·			
Start Time					
Start Flow (L/min)	All llow				
Stop Date					
Stop Time					
Stop Flow (L/min)					
Pump fault? (circle)	No Yes NA	No Yes NA	No Yes NA		
MET Station onsite? (circle)	No Yes NA	No Yes NA	No Yes NA		
Sample Type (circle)	Pre Post Clear 2 <sup>nd</sup> Clear 3 <sup>rd</sup> Clear NA	Pre Post Clear 2 <sup>nd</sup> Clear 3 <sup>rd</sup> Clear NA	Pre Post Clear 2 <sup>nd</sup> Clear 3 <sup>rd</sup> Clear NA		
Field Comments					
Cassette Lot					
Number:	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No		
Entered (LFO):	Volpe: Entered Validated	Volpe: Entered Validated	Volpe: Entered Validated		

Sheet No.: PA- 004872

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No:			ate: <u>9/18/o&amp;</u>
Address: <u> </u>	F-ROW	Owner/Tenant:	<u> </u>
usiness Name:			
Land Use: Resident			Other (ROW)
	M Other EMR Names:		Task: Crib a perater
Person Sampled/Co.	Name: //chor Behweier /	BNSF SSN: 1767	Task: Crib a perater
Data Item	م اله اله العالم والم	Cassette 2	Cassette 3
Index ID $$	BA- 00011	·	
Location ID	AD-005568		
Sample Group	Property		
Location Description	Cibby - MP1331.5		
Category (circle)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)
Matrix Type (circle)	Indoor Outdoor	Indoor Outdoor	Indoor Outdoor
Filter Diameter (circle)	25mm 37mm	25mm 37mm	25mm 37mm
Pore Size (circle)	TEM45 PCM- 0.8	TEM45 POM- 0.8	7EM45 PCM- 0.8
Flow Meter Type (circle)	Rotometer DryCal NA	Rotometer DryCal (NA 0)	Rotometer DryCal NA
Pump ID Number	4098	110/	
Flow Meter ID No.	VFB-65		
Start Date	9/18/08		
Start Time	10648 0638		
Start Flow (L/min)	1.4		
Stop Date	9/18/08	- /	
Stop Time	1502	<u> </u>	
Stop Flow (L/min)	1.4	/	
Pump fault? (circle)	No Yes NA	No Yes NA	No Yes NA
MET Station onsite?	No (es NA	No Yes NA	No Yes NA
Sample Type	TWA EXC (NA	TWA \ EXC NA	TWA EXC NA
Field Comments	,		
Cassette Lot Number: 7198170164	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
-	Volpe:	Archive Blank (circle): Yes No Volpe:	Volpe:
Entered (LFO)	Entered Validated	Entered Validated	Entered Validated

For Field Team Completion	Completed by M	QC by SIC
(Provide Initials)	Completed by PIC	do by

## LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No:	Page No:	_닉 Sampling D	ate: <u>৭/১৯/০৪</u>
Address: BNSF	-ROW_	Owner/Tenant: 3\ldots F	<u> </u>
usiness Name: NAMe:	τ		_
Land Use: Resident		., .	Other (ROW)
. •	M Other EMR Names:_		<u> </u>
Person Sampled/Co.	Name: Eric Paulack 1	BNSF SSN: 0145	Task: Laborer
Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00012		
Location ID	AD-005568		
Sample Group	Property		
Location Description	Libby - MP 1331.5		
Category (circle)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)
Matrix Type (circle)	Indoor Outdoor	Indoor Outdoor	Indoor Outdoor
Filter Diameter (circle)	25mm 37mm	25mm 37mm / /	25mm / 37mm
Pore Size (circle)	TEM45 PCM- 0.8	TEM45 PCM- 0	TEM-,45 PCM- 0.8
Flow Meter Type (circle)	Rotometer DryCal NA	Rotometer DryCal NA	Robbmeter DryCal NA
Pump ID Number	1091	118	//
Flow Meter ID No.	VFB-65		
Start Date	9/18/08		
Start Time	0648		
Start Flow (L/min)	1.4		
Stop Date	9118/08		
Stop Time	1459		
Stop Flow (L/min)	1.4		
Pump fault? (circle)	No Yes NA	No Yes NA	No Yes NA
MET Station onsite?	No (Yes) NA	No Yes NA	No Yes NA
Sample Type .	TWA EXC (NA	TWA EXC NA	TWA EXC NA
Field Comments			
Cassette Lot Number: 714870164			
	Archive Blank (circle): Yes No Volpe:	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO)	Entered Validated	Volpe: Entered Validated	Volpe: Entered Validated

For Field Team Completion (Provide Initials) Completed by ML QC by SIC

Sheet No.: SA-008692 LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR STATIONARY AIR Sampling Date: 9/18/08 Field Logbook No: Page No: \_ '4 Address: BNSF ROW Owner/Tenant: BNSF usiness Name: \_\_/\/A Other (ROW Land Use: Residential School Commercial Mining Roadway Sampling Team: CDM Other EMR Names: John Starr, Scot 9/8/06 **Data Item** Cassette 1 Cassette 2 Cassette 3 Index ID **BA-00019 BA-00020** Location ID SP- 138447 Sample Group Location Description MP1331, 5 FB (field blank) (Fs ) FB-(field blank) Category (circle) FB-(field blank) FS bB-(prep-dry blank) DB-(prep-dry blank) LB-(lot blank) LB-(lot blank) DB-(prep-dry blank) LB-(lot blank) Outdoor (NA.) Indoor Outdoor Outdoor Indoor Matrix Type (circle) NA Indoor NA 25mm Filter Diameter (circle) 25mm 37mm 37mm 25mm 37mm FEM- .45 RCM- 0.8 PCM- 0.8 Pore Size (circle) TEM- .45 TEM- .45 PCM- 0.8 GPS Status (circle) Collected Collected Collected Previously Collected Previously Collected Previously dollected Not Collected-no signal (3 attempts) Not Collected-no signal (3 attempts) Not Collected-no signal (3 attempts) Not Collected-not required for sample Not Collected- not required for sample Not Collected- not required for sample GPS File (fill in or circle) Filename: BNSF-ROW NA BNDF-ROWNA Filename: BNSF-ROW Filename NA Rotometer DryCal NA Rotometer DryCal NA Rotometer Flow Meter Type (circle) DryCal NA Pump ID Number 802365 PFKS-1 Flow Meter ID No. Start Date 9/18/108 Start Time 1012 7.6 Start Flow (L/min) 9/18/08 Stop Date Stop Time 1544 Stop Flow (L/min) 7.6 Pump fault? (circle) (NO) NA Yes No Yes NA No NA Yes NA MET Station onsite? (circle) No Nο Yes NA No Yes NA Pre Post Clear Pre Post Clear Pre Post Clear Sample Type (circle) 3<sup>rd</sup> Clear 2<sup>nd</sup> Clear 3<sup>rd</sup> Clear 2<sup>nd</sup> Clear 2<sup>nd</sup> Clear 3<sup>rd</sup> Clear (NA) NA NΑ Field Comments Cassette Lot Number: 719870164 Archive Blank (circle): Yes Nο Archive Blank (circle): Yes Archive Blank (circle): Yes No No

For Field Team Completion (Provide Initials)	Completed by: ML	QC by: 57

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Validated

Volpe:

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Validated

Entered (LFO):

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Validated\*

Sheet No.: PA- <u>004881</u> LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Field Logbook No: _ Address:ろいるチ		Sampling I Øwner)Tenant: 下から	Date: <u>9//9/</u> 68
lusiness Name:	NA	cial Mining Roadway	
Sampling Team: CD	M Other EMR Names:	Mattenz	
Person Sampled/Co.	Name: Eril Pawlack I	BNSF SSN:0148	Task: 1 & bores
Data Item	Cassette 1	Cassette 2	Cassette 3
Index.ID	BA- 00021		
Location ID	AD-005568		
Sample Group	Property		
Location Description	MP 1330.5 (33)		
Category (circle)	FS FB (field blank), LB-(lot.blank)	FS FB-(field blank)_LB-(lot-blank)	FS FB-(feld blank) LB-(lot blank)
Matrix Type (circle)	Indoor Øutdoor	Indoor Outdoor	Indoor/. Outdoor
Filter Diameter (circle)	(25mm) 37mm	25mm 37mm	25mm 37mm
Pore Size (circle)	TEM- 45 PEM-0.8	TEM- 45 VCM- 0.8	ØEM-:45 PCM-0.8
Flow Meter Type (circle)	Rotometer DryCal NA	Rotometer DryCal ; ONA	Rotometer DryCal NA
Pump ID Number	4100	0117	
Flow Meter ID No.	VFB-65		
Start Date	9/19/08	/	
Start Time	0630 0630		
Start Flow (L/min)	28		
Slop Date	9/19/08		Book days and the second secon
Stop Time	7223	/ / / / / / / / / / / / / / / / / / /	
Stop Flow (L/min)	2.8		
Pump fault? (circle)	No Yes NA	No Yes NA	No Yes NA
MET Station onsite?	Nó (TYPE) NA	No Yes NA	No Yes NA
Sample Type	TWA EXC (NA)	TWA\ EXC NA	TWA EXC NA
Field Comments			
Cassette Lot Number: 7198170\64	Archive Blank (circle): Yes No.	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
	-Volpe:	Volpe:	Volpe:
Entered (LFO)	Entered Validated	Entered Validated	Entered Validated

For Field Team Completion (Provide Initials)

Completed by  $\mu
u$ 

QC by

LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR Field Logbook No: Page No: \_ Sampling Date: Address: BN5F-Row ownern enant: 73 NSF usiness Name: AJA Other) ROW) Land Use: Residential Roadway School Commercial Minina Sampling Team: CDM Office EMR Names: Matt Lenz Person Sampled/Co. Name: Vidor Balleff BNSF SSN: 2767 Task: Crib Operator Bach meie Cassette 1 Cassette 2 Cassette 3 Index ID **BA-00022** Location ID AD-005568 Sample Group Property Location Description 1330:5 (1931) ML 1/17/08 (FS) FB-(field blank) LB-(lot blank) FS FB-(field blank) LB-(lot blank) Category (circle) FS: PB-(field blank) LB-(lot blank) Matrix Type (circle) Indoor Outdoor Indoor Outdoor Indoor Outdoor Filter Diameter (circle) 25mm) 37mm 25mm 25mm 37mm Pore Size (circle) TEM-.45 TEM-.45 PCM-Q8 CM-0.8 TEM- .45 PCM- 0.8 Flow Meter Type (circle) Rotometer DryCal -Rotometer - NA DryCal Rotometer DryCal NA Pump ID Number 4098 Flow Meter ID No. VFB-65 Start Date 9/19/08 Start Time <del>≶2€</del> ∪678 Start Flow (L/min) 2.8 Stop Date 9/19/08 Stop Time 1231 a 8 Stop Flow (L/min) Pump fault? (circle) (NO) Yes NA Yes NA No Yes ÑÃ MET Station onsite? No Yes NA Yes NA No. Yes NA Sample Type TWA EXC (NA) NA **LWA** NA **EXC** Field Comments Cassette Lot Number 7198170164 Archive Blank (circle): Yes Archive Blank (circle): Yes Archive Blank (circle): Yes Volpe: Volpe: Volpe Entered (LFO) Entered Validated Entered-Validated **Entered** Validated

8.3	or Field Team Co	mpletion	Completed	by ML		QC by	الاح	
(	Provide Initials)			· /// 6	9:13:35	AND THE PROPERTY OF THE PARTY O		į

## LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR STATIONARY AIR

Field Logbook No:	Page No:	/   Sampling D	ate: <u>9//9/08</u>
Address: BNSFR	OW	Owner/Tenant: BNS	
usiness Name:/\frac{\sqrt{1}}{2}			
Land Use: Resident			Other (ROW)
Sampling Team: CDI	M Other <u>∈MR</u> Names:_	John Starry Day	re welch
Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	20/	1 0	DV 26
	//BA- 00026	<u>α</u> /β <b>A- 00027</b>	9,9/BA- 00028
Location ID	SP- 138448	Blank	SP- 138449
Sample Group	Property	Blank	Property
Location Description	MP 133)		1 <del>1730.5</del>
	1/19/05	Blank	MP 1331 ML 9/19/08
Category (circle)	FS FB-(field blank)	FS FB-(ffeld blank)	FB-(field blank)
<u> </u>	LB-(lot blank) DB-(prep-dry blank)	LB-(lot blank) DB-(prep-dry blank)	LB-(lot blank) DB-(prep-dry blank)
Matrix Type (circle)	Indoor Outdoor NA	Indoor Outdoor NA	Indoor Outdoor NA
Filter Diameter (circle)	25mm 37mm	<b>⊘5mm</b> 37mm	25mm 37mm
Pore Size (circle)	TEM-45 (PCM-0.8)	TEM45 PCM- 0.8	TEM45 (PEM- 0,8)
GPS Status (circle) " (	Collected	Collected	Collected
	Previously Collected  Not Collected-no signal (3 attempts)	Previously Collected  Not Collected-no signal (3 attempts)	Previously Collected  Not Collected-no signal (3 attempts)
	Not Collected-not required for sample	Not Collected not required for sample	Not Collected- not required for sample
GPS File (fill in or circle)	Filename: BNSF-ROWNA	Filename: NA	Filename: BUSF-ROW NA
Flow Meter Type (circle)	Rotometer DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	(040)		8369
Flow Meter ID No.	PAKS-1		PFKS-1
Start Date	9/19/08		9/19/08
Start Time	0729	11 /	0729
Start Flow (L/min)	7.6	1////	76
Stop Date	9/19/08	11/6	9/19/08
Stop Time	1147	9/19/00	1148
Stop Flow (L/min)	7.4		7.6
Pump fault? (circle)	No Yes NA	No Yes NA	No Yes NA
MET Station onsite? (circle)	No (Yes) NA	No Yes NA	No (Res NA
Sample Type (circle)	Pre Post Clear 2 <sup>nd</sup> Clear 3 <sup>rd</sup> Clear	Pre Pest Clear 2 <sup>nd</sup> Clear 3 <sup>rd</sup> Clear NA	Pre Post Clear 2 <sup>nd</sup> Clear 3 <sup>rd</sup> Clear (NA)
Field Comments			- ;
Cassette Lot		Commence of the commence of th	
Number: 719817064		Black Control	A-Lin Black (1)
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle). Yes No
Entered (LFO):	Volpe:	Volpe:	Volpe:
	Entered Validated	Entered Validated	Entered Validated

LIBBY F Field Logbook No: Address: DNSV	2Page No: <u>'</u> –Ҡ٥Ѡ	ATTACHED TO SEE STATE OF THE PARTY OF THE PA	ate: <u>1122/68</u>
Land Use: Resident Sampling Team: CDN	ial School Commerci M Other EMR Names	al Mining Roadway الحسام لحسر	
"Person Sampled/Co	Name: Enc Pewlad	BMZE SSN: CIAS	Task: Leberer
Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID ↑A	BA- 00029		
Location ID	AD-005568	A Company of the Comp	
Sample Group	Tosti		The second secon
Location Description	MP 1309 1327.8		
	1327.8 ML 7/22/08		17 (17 ) 17
Category (circle)	PS FB-(field blank) LB-(lot blank)	FS-FB-(field blank)-LB-(lot blank)	FS FB-(field blank) LB-(lot blank)
Matrix Type (circle)	Indoor Øutdoor	Indoor Outdoor	Indoor Outdoor
Filter Diameter (circle)	25mm 37mm	25mm 37mm	25mm / 37mm
Pore Size (circle)	TEM- 45 (CM- 0.8)	TEM-, 45 PCM-0.8	TEM-45 PCM-0.8
Flow Meter Type (circle)	Rotometer DryCal NA	Rotometer Drical NA	Retometer DryCal NA
Pump ID Number	1 9099 ·	h h	
Flow Meter ID No.	UFB-G5	9/11/	
Start Date	9122/08		
Start Time	0629		
Start Flow (L/min)	<b></b>		
Stop Date	1/22/08		
Stop Time	378		
Stop Flow (L/min)	28		
Pump fault? (circle)	(No Yes NA	No Yes NA	No Yes NA
MET Station onsite?	No (Yes) NA	No Yes NA	No Yes NA
Sample Type	TWA EXC (A)	TWA EXC NA	TWA EXC NA
Field Comments			•
Cassette Lot Number: 1198170104	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle). Yes No
	-Volpe:	Volpe	Volpe:

For Field Team Completion Completed by (Provide Initials)

the state of the second of the	Page No: _	SHEET (FSDS) FOR P  #3 Sampling D  OwneyTenant: BNST	late: <u>9/22/68</u>
Sampling Team: CD	fial School Commerc M Other EAR Names:	- Colonia de Principa de Partir de Colonia de Partir de	10 10 10 10 10 10 10 10 10 10 10 10 10 1
Person Sampled/Co.	Name: Vicher Buckerser 1	<u> Buse — SSN: 2767.</u>	Task: Cab operater:
Data Item	Cassette 1	Cassette 2	Cassette 3
index ID	BA- 00030		Alternative State Expension States in the State of the St
Location ID	AD-005568		
Sample Group	Property		The state of the s
Location Description			
	MP <del>13.29.</del> 1329.8 1 <del>3.28</del> MC 9/22/55		
	9/x2/65		
Category (circle):	FS FB-(field blank): LB-(lot blank):	FS FB-(field blank); LB-(lot blank)	FS FB-(field blank) LB-(lot blank)
Matrix Type (circle)	Indoor Outdoo	Indoor Outdoor	Indoor / Outdoor
Filter Diameter (circle)	25mm / 37mm /	25mm 37mm	25mm / 37mm
Pore Size (circle)	TEM-45 (CM-0.8)	TEM45 PCM-0.8	TEM45/PCM-0.8
Flow Meter Type (circle) (	Rotometer DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	H098	Section 1997 and 1997	
Flow Meter ID No.	UFB-65		
Start Date	9/22/08	N OF	
Start Time	0629		A STATE OF S
Start Flow (L/min)	28		
Stop Date	9/22/09		
Stop Time	1318		
Stop Flow (L/min)	282		
Pump fault? (circle)	No Yes NA	No" Yes NA	No Yes NA
MET Station onsite?	No (Yes) NA	No /Yes NA	No Yes NA
Sample Type	TWA EXC (NA)	TWA/_EXC NA-4	TWA EXC NA
Field Comments	To the state of th		
Cassette Lot Number: 11981 10169			
	Archive Blank (circle): Yes: No.:	Archive Blank (circle): Yes No Volpe:	Archive Blank (circle): Yes No.
		PERSONAL PROPERTY OF THE PROPE	

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QC by

	<b>ELD SAMPLE DATA S</b>	HEET (FSDS) FOR ST	ATIONARY AIR
Field Logbook No:	Page No:		ate: 9/22/08
Address: BNSF1	ROW	Owner/Tenant: BNSF	
usiness Name:/	and the second s		DOM.
Land Use: Resident			Other (ROW)
Sampling Team: CDI	M Other <u>EMR</u> Names:_	MATT CEHE , JOH	
Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	V. Z.	<b>Eassette 2</b> MA- 00035	
V	BA- 00034	BA- 00035	<b>BA- 00036</b>
Location ID	SP- 138450	SP- 138451	Blank
		31 130 131	DIANCE ML
Sample Group	Property	Property	Proper 19/2268 Blas
Location Description	MP +329 - 1329.8	MP 1329.8	Blank
	1328 ML 1/22/08	+318 mc 9/22/08	,
Category (circle)	FS FB-(field blank)	FS FB-(field blank)	FS. FB-(figlid blank)
TO A STATE OF THE	LB-(lot blank) DB-(prep-dry blank)	LB-(lot blank) DB-(prep-dry blank)	LB-(lot blank) DB-(prep-dry blank)
Matrix Type (circle)	Indoor Outdoor NA	Indoor Outdoor NA	Indoor Outdoor NA
Filter Diameter (circle)	25mm 37mm	25mm 37mm	25mm 37mm
Pore Size (circle)	TEM- 45 PCM- 0.8	TEM45 PCM- 0.8	TEM45 PCM- 0.8
GPS Status (circle)	Collected	Collected	Collected
	Previously Collected  Not Collected-no signal (3 attempts)	Previously Collected  Not Collected-no signal (3 attempts)	Previously Collected  Not Collected-no signal (3 attempts)
I .	Not Collected-not required for sample	Not Collected- not required for sample	Not Collected- not required for sample
GPS File (fill in or circle)	Filename: BNST-ROW NA	Filename: BNSF-Row NA	Filename: NA
Flow Meter Type (circle)	Rotometer DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	6401	8369	
Flow Meter ID No.	PFK5-1	PFKS-1	
Start Date	9122108	9122108	
Start Time	1051	1051	
Start Flow (L/min)	7.6	7.6	
Stop Date	9/22/08	9/22/08	9/23/08
Stop Time	1437	1437	910
Stop Flow (L/min)	7.6	7.6	
Pump fault? (circle)	No Yes NA	(No) Yes NA	No Yes NA
MET Station onsite? (circle)	No Yes NA	No (Yes) NA	No (Yes) NA
Sample Type (circle)	Pre Post Clear 2 <sup>nd</sup> Clear 3 <sup>rd</sup> Clear	Pre Post Clear 2 <sup>nd</sup> Clear 3 <sup>rd</sup> Clear	Pre Post Clear 2 <sup>nd</sup> Clear 3 <sup>rd</sup> Clear (VA)
Field Comments			
Cassette Lot			
Number: 7198176164	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
<u> </u>	Volpe:	Volpe:	Volpe:
Entered (LFO):	Entered Validated	Entered Validated	Entered Validated

Sheet No.: PA- **004900** LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR Field Logbook No. 2 Page No. 1 Sampling Date: 9/23/08 Address: BNSF ROW OwneyTenant: BNSE usiness Name: NA Land Use: Residential School Commercial Mining Roadway Offier ( ROL) Sampling Team: CDM Offier EMR Names: Multiple Commercial Commercial Mining Roadway Person Sampled/Co. Name: Math Stashick / BUSE SSN 7132 Task Laborer Data Item - Cassette 1 Cassette 2 Cassette 3 Index ID **BA-00037** Location ID: AD-005568 Sample Group Property Location Description MP-1337 Category (circle) FS) FB-(field blank) LB-(lot blank) FS FB (field blank) LB (lot blank) FS-FB-(field blank): LB-(lot blank) Matrix Type (circle) Indoor Outdoo Indoor Outdoor Indoor Outdoor Filter Diameter (circle) 25mm 37mm: 25mm 37mm 37mm Pore Size (circle) TEM-.45 PCM-0.8 PCM-0.8 TEM-.45 TEM-:45 PCM- 0.8 Flow Meter Type (circle Rotometer DryCal Rotometer DrvCal Rotometer DryCal - NA Pump ID Number 40 Flow Meter ID No. VFB-66 Start Date 9/23/68 Start Time 0640 Start Flow (L/min) <del>0640</del> Stop Date 9/25/88 Stop Time 1148 Stop Flow (L/min) 2.4= Pump fault? (circle) (No) Yes NA No Yes No NA. MET Station onsite? No Yes NΑ ΝA Sample Type TWA EXC JWA EXC TWA EXC Field Comments Cassette Lot Number: 7198176164 Archive Blank (circle): Yes No Archive Blank (circle): Yes No Archive Blank (circle): Yes No Volpe: Volpe: Volpe: Entered (LFO) Entered Validated -Validated Entered Validated

For Field Team Completion

(Provide Initials).

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Sheet No.: PA- **004899** LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR iela Logbook No: Page No: 16 Sampling Date: 9/23/68 Address RNSF-ROW Owner/Tenant: BNSE usinėss Name: NA 4123*1*68 and Use: Residential: School Commercial Mining Roadway Sampling Team: CDM Other EMR Names Mith Lens Person Sampled/Go. Name: Date Tohn an I BNSE SSN: S315; Task: Cits operator Data Item 6 Cassette 1 Cassette 2 Cassette 3 ndex ID **BA-00038** ocation ID AD-005568 Sample Group Property ocation Description MP-1337 FS FB-(field blank)-LB-(lot blank) Category (circle) FS FB-(field blank) LB-(lot blank) FS FB-(field blank) LB-(lof blank) Matrix Type (circle) Indoor Ouldoon Indoor 💉 Outdoor Indoo Outdoor ilter Diameter (circle) 25mm 37mm 25mm 37mm 25**m**m 37mm ore Size (circle) TEM- ,45 PCM 0.8 TEM-..45 PCM-0 TÉM-:45 PCM-0.8 low Meter Type (circle) Retometer DryCal Rotometer Rotometer DryCal NA ump ID Number 4099 low Meter ID No. UFB-65 tart Date 9/23/08 tart.Time 0631 tart Flow (L/min) a.8 top Date 9/23/08 top Time 1149 lop Flow (L/min). a 8 ump fault? (circle) rd. ET Station onsite? (Yes) NA No ample Type 😁 TWA EX TWA EXC eld Comments ssette Lot mber 7148178164 Archive Blank (circle): Yes No Archive Blank (circle) Yes No Archive Blank (circle): Yes No Volpe: Valpe: Volpe: tered (LFO) Entered Validated Entered Validated For Field Team Completion Completed by 🖊 (Provide Initials)

LIBBY Field Logbook No:	FIELD SAMPLE DATA Page No:	SHEET (FSDS) FOR F	PERSONAL AIR
Address: BNSF	-Raw	Owner/Tenant: BN 5	
usiness Name: N	AND STREET AND ADDRESS OF THE PROPERTY OF THE	Barrier Commission	
Land Use: Reside			Other (Row )
Person Sampled/Co	DM Other TEMP Names	EMP CON 1946	Task Unlooke/Trespose
and the second s		SON Resul	Task Oxlodece/Trespose
Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID Y	M BA- 00039		The second secon
Location ID	AD-005568		State of the state
Sample Group	Property	A CONTRACTOR OF THE PROPERTY O	
Location Description			1 25 The second of the second
and the second s	MP-1337		
Category (circle)	FB-(field blank) LB-(lot blank)	FS : FB-(field blank) /(BC(fot blank)	FS=FB=(field blank) LB=(lot blank)
Matrix Type (circle)	Indoor Outdoor).	Indoor GuidaGr/O	Indoor Outdoor
Filter Diameter (circle)	<b>(25mm)</b> 37mm	25mm 47mm	25mm 37mm
Pore Size (circle)	TEM- 45 (CM-0.8)	TEM-: 45 PCM-0.8	
Flow Meter Type (circle)	Rotometer) DryCal NA	Rotometer OryCal NA	3688.547.8596.10.7992.2003.000
Pump ID Number	4100	///	Rotometer DryCal NA
Flow Meter ID No.	VFB-65		
Start Date -	9/2368	The second control of	
Start Time	0663		
Start Flow (L/min)	2.8		
Stop Date	9/23108		
Stop Time	1150		
Stop Flow (L/min)	27		
Pump fault? (circle)	Nb Yes NA	No' Yes NA	No Yes NA
MET Station onsite?	No (Ps) NA	No Yes NA	No.* Yes NA
Sample Type	TWA EXC (A)	TWA EXC NA	TWA EXC NA
Field Comments			
Cassette Lot Number: 7/98/70/64	Archive Blank (circle): Yes No		Archive Blank (circle): Yes No
intered (LEO)	Volpe: Validated Validated	Volpe: Entered Validated	Volpe:
		-incicu valuateo	Entered Validated

For Field Team Completion (Provide Initials)

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## LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR

Address: BASE POW Other EMR Names: Matter School Sampling Team: CDM Other EMR Names: Matter School Sampling Team: CDM Other EMR Names: Matter School Sampling Team: CDM Other EMR Names: Matter School Sampled/Co. Name: Matter School Name: Matter School Sampled/Co. Name: Matter School Name: Name: Matter School Name: Name: Matter School Name:	Field Logbook No:	<u>λ</u> Page No:	Sampling D	ate: <u>9/24/08</u>
Land Use: Residential School Commercial Mining Roadway Other: Row )  Sampling Team: CDM Other EMP. Names: Mathematical Person Sampled/Co. Name: Mathematical Person Sample Group    Data Item			Owner/Tenant: BNSE	<del>-</del>
Sampled/Co. Name: Mark Standard Sample Group    Data Item				
Data   Item			. •	Other (Row)
Data Item		and the second s		Task: Labore
Index ID		Name. Mary Stashick 1	33N. <u>1132</u>	Task
Location ID   AD-005568   Sample Group   Properfy   Location Description   MP-1339.5   Properfy   Location Description   MP-1339.5   Properfy   Location Description   MP-1339.5   Properfy   Location Description   MP-1339.5   LB-(lot blank) LB-(	Data Item	Cassette 1	Cassette 2	Cassette 3
Sample Group	Index ID $\gamma^{\prime}$	BA- 00047		
Category (circle)	Location ID	AD-005568		
Category (circle)	Sample Group	Property		
Matrix Type (circle)	Location Description	,		
Pore Size (circle)   25mm   37mm	Category (circle)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)
Pore Size (circle)   TEM- 45	Matrix Type (circle)	Indoor Outdoor	Indoor Outdoor	Indoor Outdoor
Flow Meter Type (circle)  Rotometer DryCal NA Pump ID Number 10 No.  Start Date 9/24/08  Start Time 0617  Start Flow (L/min) 2.8  Stop Date 9/24/08  Stop Time 1359  Stop Flow (L/min) 2.8  NA No Yes NA Field Comments  Cassette Lot Number: 1198170164  Archive Blank (circle): Yes No Archive Blank (circle): Yes No Volpe:	Filter Diameter (circle)	25mm 37mm	25mm 37mth	25mm 37mm
Pump ID Number  Flow Meter ID No.  Start Date  9/24/08  Start Flow (L/min)  2.8  Stop Date  9/24/08  Stop Flow (L/min)  Stop Flow (L/min)  No.  Yes NA  No.  No.  Yes NA  No.  No.  Yes NA  No.  Yes NA  No.  Yes NA  MET Station onsite?  No.  Get NA  No.  Yes NA  No.  Yes NA  No.  Yes NA  Archive Blank (circle): Yes No.  Archive Blank (circle): Yes No.  Volpe:  Volpe:	Pore Size (circle)	TEM45 PCM- 0.8	TEM45 PCM- 0/8///	TEM45 PCM- 0.8
Start Date	Flow Meter Type (circle)	Rotometer DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Start Time	Pump ID Number	4095		
Start Flow (L/min)  Start Flow (L/min)  Stop Date  9/24/08  Stop Time  1309  Stop Flow (L/min)  Pump fault? (circle)  No  Yes  NA  No  Yes  NA  No  Yes  NA  MET Station onsite?  No  Yes  NA  MET Station onsite?  No  Gel  NA  No  Yes  NA  No  Yes  NA  No  Yes  NA  No  Yes  NA  Mo  Yes  NA  No  Yes  NA  No  Yes  NA  No  Yes  NA  No  Yes  NA  Mo  Yes  NA  No  Yolpe:  Yes  No  Archive Blank (circle): Yes  No  Volpe:	Flow Meter ID No.	UFB-65		
Start Flow (L/min)  2.8  Stop Date  9/24/08  Stop Time  Stop Flow (L/min)  Pump fault? (circle)  No  Yes  NA  No  Yes  NA  No  Yes  NA  No  Yes  NA  MET Station onsite?  No  Ge  NA  No  Yes  NA  No  Yes  NA  No  Yes  NA  TWA  EXC  NA  Field Comments  Cassette Lot Number: 190170164  Archive Blank (circle): Yes  No  Volpe:  Volpe:  Volpe:	Start Date	9124/08		
Stop Date  9/24/08  Stop Time  1309  Stop Flow (L/min)  Pump fault? (circle)  No Yes NA  No Yes NA  No Yes NA  MET Station onsite?  No Yes NA  No Yes NA  TWA EXC NA  Field Comments  Cassette Lot Number: 1198170164  Archive Blank (circle): Yes No Archive Blank (circle): Yes No Volpe:  Volpe:  Volpe:  Volpe:	Start Time	0617		
Stop Flow (L/min)  Stop Flow (L/min)  Pump fault? (circle)  No  Yes  NA  No  Yes  NA  No  Yes  NA  No  Yes  NA  MET Station onsite?  No  Wes  NA  No  Yes  NA  Archive Blank (circle): Yes  No  Archive Blank (circle): Yes  No  Volpe:  Volpe:  Volpe:	Start Flow (L/min)	2.8		
Stop Flow (L/min)  Stop Flow (L/min)  No Yes NA  No Yes NA  No Yes NA  MET Station onsite?  No Yes NA  No Yes NA  No Yes NA  Sample Type  TWA EXC NA  TWA EXC NA  TWA EXC NA  Field Comments  Cassette Lot Number: 1198170164  Archive Blank (circle): Yes No Archive Blank (circle): Yes No Volpe:  Volpe:  Volpe:	Stop Date	9/24/08		
Stop Flow (L/min)  Pump fault? (circle)  Yes NA  No Yes NA  MET Station onsite?  No Yes NA  No Yes NA  No Yes NA  MET Station onsite?  No Yes NA  TWA EXC NA  TWA EXC NA  Field Comments  Cassette Lot Number: 1198170164  Archive Blank (circle): Yes No Archive Blank (circle): Yes No Volpe:  Volpe:  Volpe:	OLUD TILLE	1359 1309		
MET Station onsite?  No  Yes NA  No Yes NA  Sample Type  TWA EXC NA  TWA EXC NA  TWA EXC NA  TWA EXC NA  Cassette Lot Number: 7190170164  Archive Blank (circle): Yes No  Volpe:  Volpe:  Volpe:  Volpe:  No  Ves NA  No Yes NA  TWA EXC NA  Volpe:  V		2.7 2.8		
Sample Type  TWA EXC NA  TWA EXC NA  TWA EXC NA  Field Comments  Cassette Lot Number: 7198170164  Archive Blank (circle): Yes No  Volpe:  Volpe:  Volpe:  VWA EXC NA  TWA EXC NA  TWA EXC NA  TWA EXC NA  VOA  VOA  VOA  Volpe:  Volpe:  Volpe:  Volpe:	Pump fault? (circle)	No Yes NA	No Yes NA	No Yes NA
Field Comments  Cassette Lot Number: 기억원기이6년  Archive Blank (circle): Yes No Archive Blank (circle): Yes No Volpe:  Volpe: Volpe: Volpe:	MET Station onsite?	No (e) NA	No Yes NA	No Yes NA
Cassette Lot Number: <u>าเจอเจน</u> Archive Blank (circle): Yes No Archive Blank (circle): Yes No Archive Blank (circle): Yes No Volpe: Volpe:	Sample Type	TWA EXC (NA)	TWA EXC NA	TWA EXC NA
Number: <u>าเจอเว เเน </u> Archive Blank (circle): Yes No Archive Blank (circle): Yes No Archive Blank (circle): Yes No Volpe: Volpe:	Field Comments			
Volpe: Volpe: Volpe:		Archive Blank (circle): Yes No	Archive Blank (circle): Ves No	Archiva Blank (circle): Ves No
Entered (LFO) Entered Validated Entered Validated Entered Validated				
	Entered (LFO)	Entered Validated	Entered Validated	Entered Validated

For Field Team Completion (Provide Initials)

Completed by ML QC by DW

# LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR Field Logbook No. 2 Page No. 19 Sampling Date: 9/2억/0∛

riela Logbook No:	Page No:		rate: 4/29/08
Address: BNSF-	ROW	Owner/Tenant: <u> </u>	
`usiness Name:	JA ·		
∟and Use: Resident			Other ( ROW )
	M Other <u>EMR</u> Names:_		
Person Sampled/Co. I	Name: Karl Harms / [	3NSF SSN: 195	Task: Declipper machine of
Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID	BA- 00048		
Location ID	AD-005568		
Sample Group	Property		
Location Description	MP-1339.5		
Category (circle)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)
Matrix Type (circle)	Indoor Outdoor	Indoor Outdoor	/indefor Outdoor
Filter Diameter (circle)	25mm 37mm	25mm 37mm 7 24	25mm 37mm
Pore Size (circle)	TEM45 FCM- 0.8	TEM45 PCM- 0.8	T/EM45 PCM- 0.8
Flow Meter Type (circle)	Rotometer DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	4091		
Flow Meter ID No.	UFB-65		
Start Date	9/24/08		
Start Time	0619		
Start Flow (L/min)	2.8		
Stop Date	9/24/08		
Stop Time	1359- 1315		
Stop Flow (L/min)	λ.8		
Pump fault? (circle)	No Yes NA	No yes NA	No Yes NA
MET Station onsite?	No Yes NA	No Yes NA	No Yes NA
Sample Type	TWA EXC (A)	TWA EXG NA	TWA EXC NA
Field Comments		·	
Cassette Lot Number: 119 8170164			
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO)	Volpe: Entered Validated	Volpe: Entered Validated	Volpe: Entered Validated

For Field Team Completion (Provide Initials)

Completed by ML QC by

## LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR STATIONARY AIR

Field Logbook No:	Page No:	20 Sampling D	ate: <u>9/24/02</u>
Address: BNSF (	20W	Owner/Tenant: <u>BNS</u>	SF
usiness Name:/\(\)	(A		
Land Use: Resident			Other ROW )
Sampling Team: CDI	M Other $\underline{EMR}$ Names:_	John Starr	مرتابا
Data Item	/ Cassette 1	Cassette 2	Cassette 3
	<del>                                     </del>	<del>-</del>	
Index ID	∫ <sub>0</sub> % <b>BA- 00055</b>	//BA- 00056	/BA- 00057
Location ID (h)	SP- 138459	AD-005568	AD-005568
Sample Group	Property	Blank	Blank
Location Description		·	
·	MP-1339.5	MD-13395	MP-1339. 5
Category (circle)	FS FB-(field blank)	FS FB-(field blank)	FS FB-(field blank)
	LB-(lot blank) DB-(prep-dry blank)	LB-(lot blank) DB-(prep-dry blank)	
Matrix Type (circle)	Indoor Outdoor NA	Indoor Outdoor) NA	Indoor Outdoor (NA
Filter Diameter (circle)	25mm 37mm	(25mm) 37mm	25mm 37mm
Pore Size (circle)	TEM 45 PCM- 0.8	TEM45 (PCM- 0.8	TEM45 PCM- 0.8
GPS Status (circle)	Collècted	Collected	Collected
	Previously Collected	Previously Collected	Previously Collected
	Not Collected-no signal (3 attempts)	Not Collected-no signal (3 attempts)	Not Collected-no signal (3 attempts)
	Not Collected-not required for sample	Not Collected- not required for sample	Not Collected- not required for sample
GPS File (fill in or circle)	Filename: BNSF-ROW NA	Filename: NA	Filename: NA
Flow Meter Type (circle)	Rotometer DryCal NA	Rotometer DryCal NA	Rotometer DryCal NA
Pump ID Number	8369		
Flow Meter ID No.	PFK5-1		
Start Date	9/24/08		
Start Time	0911_	nec /	ul/
Start Flow (L/min)	7.6	11/	
Stop Date	9/24/08	9/2400	1/29/08
Stop Time	1246		
Stop Flow (L/min)	7.6		
Pump fault? (circle)	ONO Yes NA	No / Yes NA	No / Yes NA
MET Station onsite? (circle)	No (Yes) NA	No Yes NA	No / Yes NA
Sample Type (circle)	Pre Post Clear 2 <sup>nd</sup> Clear 3 <sup>rd</sup> Clear	Pre Post Clear 2 <sup>nd</sup> Clear 3 <sup>rd</sup> Clear NA	Pre Post Clear 2 <sup>nd</sup> Clear NA
Field Comments			
Cassette Lot			
Number: 7 198170164	Andrew Direct (State )	And the Block (1911)	A-th- Di I ( ) Y
	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LFO):	Volpe: Entered Validated	Volpe: Entered Validated	Volpe: Entered Validated

Address: BNS Nusiness Name: Land Use: Reside Sampling Team: C	Page No.  F-Row  Intial School Comme  DM Other) FMR Name	Owner/Tenant: BUS	Date: 9/25/08  F
Data Item	MC Cassette 1 99 BA- 00058	Cassette 2	Cassette 3
Location ID  Sample Group  Location Description	AD-005568 Property MP-1341		
Category (circle)  Matrix Type (circle)  Filter Diameter (circle)  Pore Size (circle)  Flow Meter Type (circle)	FS FB-(field blank) LB-(lot blank Indoor Outdoor)  25mm 37mm  TEM- 45 PCM- 0.8  Rofometer DryCal NA	JINDOOR OUTDOOR  25mm 37mm  TEM- 45 PCM- 98  Rotometer DryCa NA	FS FB-(field blank) LB-(lot blank) Indoor Outdoor 25mm 37mm TEM- 45 PCM- 0.8 Rotoryleter: DryCal NA
Pump ID Number Flow Meter ID No. Start Date Start Time Start Flow (L/min)	4091 UFB-65 9/25/08 0623	9/25/0	Rotoryfeter DryCal NA:
Stop:Date Stop:Time Stop:Flow (L/min) Pump fault? (circle) MET Station onsite?	9/25/08 0925 2.8 No Yes NA No Wes NA	No Yes NA	No Yes NA
Sample Type Field Comments Cassette Lot Number: 1198170164	TWA EXC (A)  Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	TWA EXC NA  Archive Blank (circle): Yes No
Entered (LFO)	Volpe: Entered Validated		Volpe: Entered Validated

For Field Team Completion
(Provide Initials).

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	Page No:		Date: 9/a/5/08
Sampling Team: Cl	NA School Commerce DM Other RIMR Names: ) Name: Bryce Jawenbers /	cial Mining Roadway العام العام	Offer(Pow )
Data Item	Cassette 1	Cassette 2	Cassette 3
Index ID 4	BA- 00059		
Location ID	AD-∞5568		The second secon
Sample Group	Property		
Location Description	ЦР-1341		
Category (circle)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)	FS FB-(field blank) LB-(lot blank)
Matrix Type (circle)	Indoor Outdoo	Indoor Outdoor	Indoor Outdoor
Filter Diameter (circle)	25mm 37mm	25mm 37mm	25mm / 37mm -
Pore Size (circle)	TEM=.45 (POM= 0.8)	TEM45 PCM- 0.8	TEM- 45 PCM- 0.8
Flow Meter Type (circle)	Rotomete DryCal NA	Rotometer DryCel NA	Rotogneter DryCal NA
Pump ID Number	14095		
Flow Meter ID No.	UFB-65	040	18
Start Date	9/25/08	$\gamma \gamma $	
Start Time	0675		
Start Flow (Umin)	2.8		
Stop Date	9/25/08		
Stop Time	ofay -		
Stop Flow (L/min)	2.8		
Pump fault? (circle)	No Yes NA	No Yes NA	No Yes NA
MET Station onsite?	No (ES NA	No Yes NA	No Yes NA
Sample Type Field Comments	TWA EXC (NA)	TWA EXC NA	TWA EXC NA
Cassette Lot Number: <u>〜 19名コの</u> と	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No	Archive Blank (circle): Yes No
Entered (LF0)	Volpe; Entered Validated	Volpe: Service Validated	Volpe:
		Validated	Entered Validated

For Field Team Completion
(Provide Initials)
Completed by

QC by DW

Sheet No.: PA= 004894 LIBBY FIELD SAMPLE DATA SHEET (FSDS) FOR PERSONAL AIR Field Logbook No: 2 Page No: 23 Sampling Date: 9/25/68 Owner/Tenant BUSE Commercial: Mining Roadway Other (Row) Cassette 2 Cassette 3 FS FB-(field blank) LB-(lot blank) Outdoor Indoor Outdoor 37mm 25mm-37mm PCM- 0.8 TEM- .45 PCM-0.8 DryCal · NA Rotometer DryCal

Sampling Team: CDM Other EMR Names: Note: Person Sampleo/Co-Name - Data Item Cassette 1 Index ID **BA-00069** Location ID 4D-005568 Sample Group Location Description Blank FS (B-(feld blank) LB-(lot blank) Category (circle) FS FB-(field blank) LB-(lot blank) Matrix Type (circle) Indeor (Outdoor) Indoor Filter Diameter (circle) 25mm) 37mm 25mm Pore Size (circle) TEM- .45 PCM- 0.8 TEM- .45 Flow Meter Type (circle) Rotometer DryCal Rotometer Pump ID Number Flow Meter ID No. Start Date Start-Time Start Flow (L/min) Stop Date Stop Time Stop Flow (L/min) Pump fault? (circle) No NA No⊹ NA No Yes NA MET Station onsite? No ÑÀ Νō Yes NA Sample Type: TWA NΑ TWA NΑ EXC NA EXC Field Comments Cassette Lot Number: 115176\64 Archive Blank (circle): Yes Archive Blank (circle). Yes No Archive Blank (circle): Yes No Volpe: Volpe: Volpe: Entered (LFO) Entered Validated Entered Validated Entered Validated

> For Field Team Completion ac by  $\mathcal{D}\mathcal{K}$ Completed by ML (Provide Initials)

Address BNSF ROW

- School:

usiness Name: MA Land Use Residential



## APPENDIX D

FIELD CHANGE ORDERS

Field Change Order (FCO) #17-1
DATE: Wednesday, September 17, 2008
ADDRESS: BNSF ROW
PROJECT NAME: Libby Asbestos Project
DESCRIPTION OF CHANGE AND RATIONALE
The flow rates on ABS monitors could not reach 5 L/min (most could reach 2.8 L/min) – had to reassess using higher sensitivity (0.0024 cc-1), instead of original target sensitivity of 0.001 cc-1).
The reduced flow rates led to extending the sampling period from 2 and 4 hr/event to 6 and 8 hr/event.
SIGNATURE APPROVALS
EPA MANAGEMENT: DATE:
EMR MANAGEMENT: DATE: 9/11/08

DATE: Wednesday, September 17, 2008 ADDRESS: BNSF ROW PROJECT NAME: Libby Asbestos Project  DESCRIPTION OF CHANGE AND RATIONALE  The SAP was written assuming that all train activity on both tracks (main and siding) would be halted during maintenance activities. However, Day 1 maintenance activity occurred on a track siding and after several hours into the maintenance activities, the main track opened to passing trains.
The SAP was written assuming that all train activity on both tracks (main and siding) would be halted during maintenance activities. However, Day 1 maintenance activity occurred on a track siding and after several hours into the maintenance activities, the main track opened to
halted during maintenance activities. However, Day 1 maintenance activity occurred on a track siding and after several hours into the maintenance activities, the main track opened to
As a result, passing train activities were noted in the field logbook.
SIGNATURE APPROVALS
EPA MANAGEMENT: DATE:
EMR MANAGEMENT: DATE: 9/11/08

Field Change Order (FCO) #17- 6	
DATE: Wednesday, September 17, 2008	
ADDRESS: BNSF ROW PROJECT NAME: Libby Asbestos Project	
FROJECT MAINE. LIDBY Aspestos Project	
DESCRIPTION OF CHANGE AND RATIONALE	
Event duration for the worker is variable (up to 10 hr days) and not controlled by sampling design team. Sample team can only control turning on pumps in the morning (approximately 6:30 am) and picking pumps up at the end of the working day (late afternoon) – had to reassess flow rate as setting ABS worker pumps to 2.8 L/min for roughly 10 hour sampling event (6:30 am to 4:30 pm) yielded filter loading.	
Reassessed flow rate for worker to avoid filter loading for next sampling event.	
CIONATURE ARREOVAL C	
SIGNATURE APPROVALS	
EPA MANAGEMENT: DATE:	
EMR MANAGEMENT: DATE: 4/17/08	

Field Change Order (FCO) #18-2				
DATE: Thursday, September 18, 2008				
ADDRESS: BNSF ROW PROJECT NAME: Libby Asbestos Project				
FROJECT NAME. LIDDY ASDESTOS FTOJECT				
DESCRIPTION OF CHANGE AND RATIONALE				
Reassessed flow rate for worker to avoid filter loading for sampling event due to previous day's filter loading. Set flow rate from 2.8 L/min to 1.0 L/min to see if loading would still be an issue.				
SIGNATURE APPROVALS				
EPA MANAGEMENT: DATE:				
EMR MANAGEMENT: DATE: 9/18/08				

Field Change Order (FCO) #18-3				
DATE: Thursday, September 18, 2008				
ADDRESS: BNSF ROW				
PROJECT NAME: Libby Asbestos Project				
DESCRIPTION OF CHANGE AND DATIONALE				
DESCRIPTION OF CHANGE AND RATIONALE				
Note that sampling on Day 1 occurred in a very dry dusty location, with resulting filter loading on worker ABS samples; whereas, Day 2 sampling location was also dry, but significantly less dusty (probably due to minimal exposed soil, and no dirt access road alongside trackage).				
SIGNATURE APPROVALS				
SIGNATURE AFPROVALS				
EPA MANAGEMENT: DATE:				
EMR MANAGEMENT: DATE: 9/18/08				

Field Change Order (FCO) #19-1					
DATE: Friday, September 19, 2008					
ADDRESS: BNSF ROW					
PROJECT NAME: Libby Asbestos Project					
DESCRIPTION OF CHANGE AND RATIONALE					
DESCRIPTION OF CHANGE AND RATIONALE					
Scheduled maintenance work was less than 1,000 feet in length. sampling period limited compared to Day 1 and Day 2 sampling. It suit shortened maintenance length and duration.					
SIGNATURE APPROVALS					
OIGHATONE AFFROVALO					
EPA MANAGEMENT:	DATE:				
EMR MANAGEMENT:	DATE: <u>9/11/08</u>				

Field Change Order (FCO) #22-1				
DATE: Monday, September 22, 2008				
ADDRESS: BNSF ROW				
PROJECT NAME: Libby Asbestos Project				
DESCRIPTION OF CHANGE AND RATIONALE				
The SAP called for ABS sampling only during dry conditions, since it was based on EPA guidance. Sampling on this day event included light to heavy rain and was completed. Soil sampling, ABS and stationary air sampling was completed in otherwise normal fashion.				
SIGNATURE APPROVALS				
SIGNATURE AFFROVALS				
EPA MANAGEMENT: DATE:				
EMR MANAGEMENT: DATE: 9/22/08				



## APPENDIX E

WORKER AIR SAMPLE LABORATORIES REPORTS

Page 1 of 1

## EMSL Analytical, Inc.

107 Haddon Avenue

Westmont, New Jersey 08108 Phone: (856) 858-4800 Fax: (856) 858-9551



#### LETTER OF TRANSMITTAL

To:	Scott Carney		Date:	July 17 ,2009	
	EMR, Inc.		From:	Charles E. LaCerra	
	11 East Superior Street		Re:	Libby, MT BNSF Work	
	Suite 260			Mobile Lab Analytical Reports	
	Duluth, MN 55802			See Below	
	Phone: 763-277-5200				
We are se	nding you: × Atta	ached		Under separate cover via	
	Solicitation	☐ Copy	of Letter		
	Subcontract	As no	oted	Other	
	Laboratory Samples	Maly Analy	tical Repor	rts	
These are	transmitted as indicated	l below:			
	ExecuteOriginal(s)	Revie	w & Com	mment  For Approval	
	ReturnOrginal(s)	As Re	equested	Respond as instructed	
$\boxtimes$	For Your Information/File			Other	
Remarks:					
Enclosed p	olease find one (1) copy of	f the follow	ing mobil	le lab analytical reports for analysis for	
your review	w and use for the above re	eferenced p	roject:		
270900045	5				
Please feel	free to contact me with a	ny questior	ıs or if you	ou require additional information	
Copy to:			Signed:	1: Charles La Cerra	

#### INTERNAL CHAIN OF CUSTODY

4/14/2009 4:42:05 PM

Order ID: 270900045

Attn:

Fax:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

(218) 625-2337

Project:

L14984 Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Phone: (218) 625-2332

EMSL Order:

Customer ID

Received:

**Customer PO:** 

270900045

EMRI78

EMSL Proj ID:

BNSF Libby, MT 2008

04/14/09 4:11 PM

Cust COC ID

Fest: TEM ISO 10312 Matrix Air	TAT: 10 Days Qt	<u>v:</u> 14
Acct Sts: Sisprsn: epodell  Inter- Lab Sample Transfer	Logged: jwyattpescador Date: Sample Acceptable Condition: Unacceptable	4/14/2009
Samples Relinquished:  Samples Received:  Package Mailed to Westmont:  Date	Comments	
Method of Delivery: Includes: (Circle)	Initial Prep (Initials/Lab): Sour	Date: 4/15/a
Benchsheets Sample Slides Sample filters Micrographs GridBox Other	Grid Prep (Initials/Lab): 2000 For Special Projects Use Only:	Date: 4/15/0
Final Package Received: Date:	Date Package Review: C	Date: 7-1\$ Date: 7117

S	pe	)C	ial	In	str	uc	tic	ns	

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	<b>√270900045-0001</b> A	BA-00001 (50m), (	OL-LOOSE Debris in Coul	4/24/2009 4:11:00 PM
270900045	`270900045-0002	BA-00002 (25m2),(	DL-Loose Debris In Coul	4/24/2009 4:11:00 PM
270900045	`270900045-0003 c	BA-00011		4/24/2009 4:11:00 PM
270900045	<b>270900045-0004</b> p	BA-00012		4/24/2009 4:11:00 PM
270900045	`270900045-0005 g	BA-00021 (25)		4/24/2009 4:11:00 PM
270900045	<b>∖270900045-0006</b> €	BA-00022		4/24/2009 4:11:00 PM
270900045	√270900045-0007 6	BA-00029		4/24/2009 4:11:00 PM
270900045	<b>√2</b> 70900045-0008 H	BA-00030		4/24/2009 4:11:00 PM
-b, rd, \$25	27	09 BNS -38 6/	(r)	

#### INTERNAL CHAIN OF CUSTODY

4/14/2009 4:42:05 PM

Order ID: 270900045

Attn:

Fax:

Project: L14984

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802 (218) 625-2337

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Phone: (218) 625-2332

Received:

Customer ID

Customer PO:

EMSL Order:

270900045

EMRI78

EMSL Proj ID:

BNSF Libby, MT 2008

04/14/09 4:11 PM

**Cust COC ID** 

	270900045-0009 & BA-00037 (25ml), OL-LOOSE DEBTS in Cow	4/24/2009 4:11:00 PM
270900045	270900045-00101-BA-00038 (50~L), DL-LOOSE DEbris in Cool	4/24/2009 4:11:00 PM
270900045	270900045-0011 k >BA-00047 (RB)	4/24/2009 4:11:00 PM
270900045	270900045-0012 L\BA-00048	4/24/2009 4:11:00 PM
270900045	270900045-0013 M BA-00058	4/24/2009 4:11:00 PM
270900045	270900045-0014 N BA-00059	4/24/2009 4:11:00 PM

4/14/2009 4:42:23 PM

Order ID: 270900045

Attn:

Fax:

Project:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

(218) 625-2337

L14984

Phone: (218) 625-2332

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

EMSL Order:

Received:

Customer ID:

Customer PO:

EMSL Proj ID:

270900045

EMRI78

BNSF Libby, MT 2008

04/14/09 4:11 PM

**Cust COC ID** 

Test: TEM ISO 10312		<u>Matrix:</u> Air		TAT: 10 Days	<b>Qty:</b> 14
Order ID	Lab Sample#	Cust. Sample #	Location		Due Date
270900045	270900045-0001	BA-00001			4/24/2009 4:11:00 PM

Comments:	 

ANALYZED:	RNOV	Date:	4/16/09
Preliminary Data Sent to Special Projects:	RKM	Date:	4/17/09
Data Entry:	بىو	Date:	P0/06/4
Structure Review:		Date:	
Data Valildation:	78	Date:	412409
Reported to Offent:	TP	Date:	4/22/09

Micrograph Number	Type Offraction or Morphology

4/14/2009 4:42:23 PM

Order ID: 270900045

Attn:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

Fax: Project: L14984

(218) 625-2337

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Phone: (218) 625-2332

Received:

Customer ID:

Customer PO:

EMSL Order:

EMSL Proj ID:

270900045

EMRI78

BNSF Libby, MT 2008

04/14/09 4:11 PM

Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0002	BA-00002		4/24/2009 4:11:00 PM

Comments	•
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ANALYZED:	RM	Date:	4/16/09
Preliminary Data Sent to Special Projects:	R ICM	Date:	4/17/09
Date Entry:	. ص	Date:	Polosy
Structure Roview:		Date:	t /
Data Validation:	TP	Date:	4/21/09
Reported to Olient:	TP	Duie:	422/09

Micrograph Number	Type Cliffraction or Morphology

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn:

Fax:

Project:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

(218) 625-2337

Phone: (218) 625-2332

L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID:

Customer PO:

Received:

04/14/09 4:11 PM

EMRI78

EMSL Order:

EMSL Proj ID:

270900045 BNSF Libby, MT 2008

Cust COC ID

Order ID	Lab Sample#	Cust. Sample #	Location	Due Date
270900045	270900045-0003	BA-00011		4/24/2009 4:11:00 PM

Comments	z·		
Comment	3,		

ANALYZED:	w	Date:	4/16/09
Preliminary Data Sent to Special Projects:	RKM	Date:	4/17/09
Data Entry:	<u>ف</u>	Oste:	4/20/09
Structure Review:		Date:	7
Data Valildation:	TP	Date:	4/24/09
Reported to Client:	TP	Date:	4/22/09

	Micrograph Number	Type Offrection or Morphology
د		

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn:

Fax:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

(218) 625-2337 Project: L14984

Phone: (218) 625-2332

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Received:

EMSL Order:

Customer ID:

Customer PO:

EMSL Proj ID:

270900045

EMRI78

BNSF Libby, MT 2008

04/14/09 4:11 PM

**Cust COC ID** 

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0004	BA-00012		4/24/2009 4:11:00 PM

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ANALYZED:	RMY	Date:	4/16/09
Preliminary Data Sent to Special Projects:	RKM	Date:	4/17/09
Osto Estry:	<u>o</u> ı	Date:	4/20/09
Sinucture Review:		Data:	
Deta Validation:	78	Date:	4/24/09
Reported to Chent:	76	Date:	4 22 09

Micrograph Number	Type Orifrection or Morphology

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn:

Fax:

Project:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

(218) 625-2337

Phone: (218) 625-2332

L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID:

Customer PO:

Received:

04/14/09 4:11 PM

EMSL Order:

270900045

EMRI78

EMSL Proj ID:

BNSF Libby, MT 2008

**Cust COC ID** 

Order ID	Lab Sample#	Cust. Sample #	Location	Due Date
270900045	270900045-0005	BA-00021		4/24/2009 4:11:00 PM

Comments:	
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ANALYZED:	pry	Date:	4/16/09
Preliminary Data Sent to Special Projects:	RKM	Date:	
Data Entry:	oi	Date:	9/17/09 4/20/09
Simuclare Review:		Oate:	
Data Valiidation:	TP	Date:	4) वर्ग वर्ग
Reported to Client:	TP	Daie:	प्रवा09

Microgreph Number	Type
	Offraction or Morehology

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn:

Fax:

Project:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

(218) 625-2337

L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Phone: (218) 625-2332

EMSL Proj ID:

EMSL Order:

Customer ID:

Customer PO:

Received:

270900045

BNSF Libby, MT 2008

04/14/09 4:11 PM

EMRI78

**Cust COC ID** 

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0006	BA-00022		4/24/2009 4:11:00 PM

ANALYZED:	sny	Date:	9/17/09
Preliminary Data Sent to Special Projects:	Rican	Date:	4/17/09
Data Entry:	عد	Dete:	4 20/09
Structure Review:	-	Data:	
Dats Validation:	TP	Date:	4/2409
Reported to Chent:	78	Daie:	4/20/09

Micrograph Number	Type Orifraction or Morphology
	·

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn:

Fax:

Project:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

L14984

Duluth, MN 55802

(218) 625-2337

Phone: (218) 625-2332

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

EMSL Order:

Customer ID:

Customer PO:

Received:

EMSL Proj ID:

270900045

EMRI78

BNSF Libby, MT 2008

04/14/09 4:11 PM

**Cust COC ID** 

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0007	BA-00029		4/24/2009 4:11:00 PM

Comm	ents:

ANALYZED:	RNY	Date:	4/17/09
Preliminary Data Sent to Special Projects:	Riam	Date:	4/17/09
Osto Entry:	، صد	Date:	420/09
Simplem Review:		Deta:	
Osta Validation:	78	Date:	4/2/09
Reported to Chemic	TP	Date:	4) 22/05

Microgreph Number	Type Diffraction or Morphology
,	

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn:

Project:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

Fax:

(218) 625-2337

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

L14984

Phone: (218) 625-2332

EMSL Order: EMSL Proj ID:

Customer ID:

Customer PO:

Received:

EMRI78

04/14/09 4:11 PM

270900045

BNSF Libby, MT 2008

**Cust COC ID** 

Order ID	Lab Sample#	Cust. Sample #	Location	Due Date
270900045	270900045-0008	BA-00030		4/24/2009 4:11:00 PM

Comments:
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ANALYZED:	pry	Date:	4/17/03
Preliminary Data Sent to Special Projects:	R.Km	Date:	
Oata Entry:	a	Dete:	4/17/09
Structure Review:		Date:	
Data Validation:	+0	Date:	4 2409
Reported to Client:	78	Daie:	4/22/05

Micrograph Number	Type Orffrection or Morphology

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn:

Fax:

Project:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

(218) 625-2337

L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Phone: (218) 625-2332

EMSL Order:

Customer ID:

Customer PO:

Received:

EMSL Proj ID:

270900045

EMRI78

BNSF Libby, MT 2008

04/14/09 4:11 PM

**Cust COC ID** 

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0009	BA-00037		4/24/2009 4:11:00 PM

ANALYZED:	pry	Date:	4/17/09
Preliminary Data Sent to Special Projects:	RKM	Date:	4/17/09
Osta Entry:	oe	Date:	41-5-109
Structure Review:		Date:	(22)
Data Valiidation:	18	Date:	4/24/09
Reported to Chent:	76	Daie:	4122109

	Microgreph Number	Type Orffrection or Morphology
·		

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn:

Fax:

Project:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

(218) 625-2337

L14984

Phone: (218) 625-2332

EMSL Order: Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

EMSL Proj ID: **Cust COC ID** 

Customer ID:

Customer PO:

Received:

EMRI78

04/14/09 4:11 PM

270900045 BNSF Libby, MT 2008

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0010	BA-00038	,	4/24/2009 4:11:00 PM

Comments:	
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ANALYZED:	esn	Date:	4/17/09
Preliminary Data Sent to Special Projects:	Rkm	Date:	4/17/09
Data Entry:	91	Date:	4/17/09
Structure Roview:		Date:	
Data Validation:	TP	Date:	4/24/09
Reported to Chent:	TP	Date:	4/22/09

Microgreph Number	Type Orfrection or Morphology
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4/14/2009 4:42:24 PM

Order ID: 270900045

Attn:

Fax:

Project:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

(218) 625-2337

L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Phone: (218) 625-2332

EMSL Order:

Received:

EMSL Proj ID:

Customer ID:

Customer PO:

270900045

EMRI78

BNSF Libby, MT 2008

04/14/09 4:11 PM

**Cust COC ID** 

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0011	BA-00047		4/24/2009 4:11:00 PM

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Comments.	
1	

ANALYZED:	prof	Date:	4/17/09
Preliminary Data Sent to Special Projects:	RKM	Date:	4/17/09
Date Entry:	عو	Date:	4/17/09
Simucture Review:		Data:	
Osta Valildation:	TR	Date:	42409
Reported to Chent:	TP	Date:	4122/09

Micrograph Number	Type Offraction or Morphology

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn:

Project:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

Fax:

(218) 625-2337

L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Phone: (218) 625-2332

EMSL Order:

Received:

Customer ID:

Customer PO:

EMSL Proj ID:

270900045

EMRI78

BNSF Libby, MT 2008

04/14/09 4:11 PM

**Cust COC ID** 

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0012	BA-00048		4/24/2009 4:11:00 PM

Comments:		

ANALYZED:	pm	Date:	4/17/09
Preliminary Data Sent to Special Projects:	Rkm	Date:	4/17/04
Data Entry:	عو.	Date:	4/20/09
Structure Reviews		Date:	
Data Valiidation:	tP	Date:	4/24/09
Reported to Client:	tl	Date:	4)22/09

Micrograph Number	Type Oxfraction or Morphology

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn:

Project:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

Fax:

(218) 625-2337

Phone: (218) 625-2332

L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Customer ID:

Customer PO:

Received:

04/14/09 4:11 PM

EMRI78

EMSL Order: 270900045

EMSL Proj ID:

BNSF Libby, MT 2008

Cust COC ID

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0013	BA-00058		4/24/2009 4:11:00 PM

Comments:	-

ANALYZED:	RHPV	Date:	4/17/09
Preliminary Data Sent to Special Projects:	RKM	Date:	4/17/09
Date Entry:	er	Date:	420/09
Siructure Review:		Date:	1 1
Data Validation:	18	Date:	4/24/09
Reported to Client:	18	Daie:	4122109

Microgreph Number	Type Orffraction or Morphology

4/14/2009 4:42:24 PM

Order ID: 270900045

Attn:

Project:

Scott Carney

EMR, Inc.

11 East Superior Street

Suite 260

Duluth, MN 55802

(218) 625-2337 Fax:

L14984

Samples collected 9/17, 18, 19, 22, 23, 24, 25/2008

Phone: (218) 625-2332

EMSL Proj ID:

EMSL Order:

Customer ID:

Customer PO:

Received:

270900045

EMRI78

BNSF Libby, MT 2008

04/14/09 4:11 PM

**Cust COC ID** 

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270900045	270900045-0014	BA-00059		4/24/2009 4:11:00 PM

Comments:		
Comments.		
1		

ANALYZED:	pn	Date:	4/17/09	
Preliminary Data Sent to Special Projects:	RKM	Date:	4/17/09	
Data Entry:	<u>.</u> QL	Oste:	4/17/06 4/20/09	
Structure Review:		Date:		
Data Validation:	TP	Date:	4/24/09	
Reported to Chent:	TP	Date:	4/22/09	

Micrograph Number	ĩy <b>y</b> o		
~	Offrection or Morphology		

# **Indirect Preparation Record**

INDIRECT PREPARATION N⊆CORD REVISION 1 FEBRUARY 9, 2009

TEM Air (Circle One)

TEM Dust

PCM

EFA <u>360</u> (mm2)

		Indirect w	ithout ashing		Dilution Filtra	tion					Indirect w	ith Ashing		
Prepped by:	Date:	Fraction	1st	Volume	Volume of 1st	2nd Re-	Volume	Volume of 2nd Re-	3rd Re-	Volume	Fraction	Volume used to	Volume	OK to
EUP	4)15/09	of filter used	Resuspend Volume	applied to filter	Resuspend used	suspend Volume	applied to filter	suspend used	suspend Volume	applied to filter	of filter ashed	resuspend residue	applied to 2nd filter	Prep to Grid?
Order ID	Sample #		mL	mL	mL	mL	mL	mL	mL	mL		mL	mL	Y/N
270900045	ВАТОФОІ										V2	100	10	
						***************************************							15	
													25	
													50	Y
	BA-10002										1/2	( oo	LO	/
													15	
													25	y
													50	
	BA-00037										1/2	lov	( D	
	,												15	
	·												25	У
													50	
	BA00038										½	100	10	
	•												15	
	,						·						25	
													50	у
	FilBlankon										1/2	100	001	y
	AshBlank										<b>t</b> 2.	100	001	У
	MB											100	rov	У

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Page \_\_\_\_\_ of \_\_\_\_

**SAMPLE ID** 

Status

QA Type

Overloaded BA-00001 Not QA

270900045-0001

Lab Sample Number

**EPA Sample Number** 

Sample Type Air
Category Field
Prep Direct
Counting Rules 10312

**PARAMETERS** 

Effective filter area 385.0 mm2
Indirect factor 1.00E+00
Number of Grid Openings (amphibole) 0
Number of Grid Openings (chrysotile) 0
Grid opening area 0.013 mm2

Volume (L) or Area (cm2) 1344 L
Sensitivity (amphibole) s/cc
Sensitivity (chrysotile) s/cc

Area Examined (amphibole) 0.000 mm2
Area Examined (chrysotile) 0.000 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
> 3·1	0.5	none

Stopping Rules:

Target S	Max GOs	Max N
0.0024	39	50

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<≃.5	>≃ 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00001\_270900045-0001\_ISO\_D.xls

4/21/2009, 3:43 PM

FILE NAME: BA-00001\_270900045-0001\_ISO\_D.xls

FILE TYPE: Original

### BNSF 2008 Libby Site Investigation v33

#### **TEM Asbestos Structure Count**

Laboratory name:	EMSL27	EPA Sample Number:
Instrument	OL 100 CX II (27-2	Sample Type
Voltage (KV)	100kv	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)
Magnification	19,000x	Date received by lab
Grid opening area (mm2)	0.0130	Lab Job Number:
Scale: 1L =	1.000	Lab Sample Number:
Scale: 1D =	1.000	Number of grids prepared
Primary filter area (mm2)	385.0	Prepared by
Secondary Filter Area (mm2)	360.0	Preparation date
Category	Field 🔻	EPA COC Number
Filter Status	Overloaded	

EPA Sample Number:	BA-00001		
	27.00001	Analyzed by	
Sample Type	Air 🔻	Analysis date	
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1344	Prep	Direct 🔻
Date received by lab	4/14/2009	loose material or debris in the	Yes
Lab Job Number:	270900045	Counting rules	ISO (Air or Dust)
Lab Sample Number:	270900045-0001	Grid storage location	
Number of grids prepared		Archive filter(s) storage location	Westmont
Prepared by			
Preparation date		F- factor	
EPA COC Number	L14984	QA Type	Not QA
	en sa ting in the sale	ကိုကျနှင့် ကို မိုင်းသူမှာ အသည်။ လူလည်း ကောင်းမေးကိုက နာရီလိုင်းသည် ကရင်းသို့နှေနဲ့	er i kalendari da

Direct	
Yes	
ISO (Air or Dust)	
Westmont	
1	
Not QA	

#### Recording Rules:

#### Stopping Rules:

≥ 3:1 🔻	Minimum Aspect Ratio	0.00240	Target Sensitivity
0.50	Minimum Length (um)	10	target sensitivity
none	Minimum Width (um)	39	Maximum # of GOs
		50	Maximum # of Structure
E-factor C	alculations	10	Estimated # of GOs

#### F-factor Calculation:

#### Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

#### COMMENTS

Overloaded

EPA SAMPLE ID: LAB SAMPLE ID:

BA-00001 270900045-0001 Sample Type Air
Count Rule 10312

Prep Direct
QA Type Not QA

ERROR CHECK
OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 QA by: QA date:

T. Peters 4/21/2009

Grid	Grid	Structure	No. of S	tructures	Dimens	ions (a)	Identification		Mineral C	lass (b)			1 = ye	s, blank	= no	Fract. GO
Gila	Opening	Туре	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.



#### SAMPLE ID

Status Analyzed BA-00001 **EPA Sample Number** Not QA QA Type 270900045-0001

Lab Sample Number

Sample Type Air Field Category Indirect Prep 10312 Counting Rules

#### **PARAMETERS**

Effective filter area 360.0 mm2 Indirect factor 2.50E-01 Number of Grid Openings (amphibole) 39 Number of Grid Openings (chrysotile) 39 Grid opening area 0.013 mm2

Volume (L) or Area (cm2) 1344 L Sensitivity (amphibole) 2.11E-03 s/cc Sensitivity (chrysotile) 2.11E-03 s/cc Area Examined (amphibole) 0.507 mm2

Area Examined (chrysotile) 0.507 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3·1	0.5	none

Stopping Rules:

Target S	Max GOs	Max N
0.0024	•	50

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0
Check	OK	OK	OK		

OK Check **OK** OK Grand total 0

CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	<dl< th=""><th><dl< th=""><th><dl< th=""><th></th><th></th></dl<></th></dl<></th></dl<>	<dl< th=""><th><dl< th=""><th></th><th></th></dl<></th></dl<>	<dl< th=""><th></th><th></th></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00001\_270900045-0001\_ISO\_04-16-09\_I.xls

4/21/2009, 3:47 PM

FILE NAME: BA-00001 270900045-0001 ISO 04-16-09 Lxls

FILE TYPE: Original

#### Recording Rules:

#### Stopping Rules

11000		1 Tules.	Otopping i	cuico.
≥ 3:1	•	Minimum Aspect Ratio	0.00240	Target Sensitivity
0.5	0	Minimum Length (um)	DE.	GOs required to reach target sensitivity
nor	ne	Minimum Width (um)		Maximum # of GOs
			50	Maximum # of Structure
			35	Fetimated # of GOs

# BNSF 2008 Libby Site Investigation v33

#### **TEM Asbestos Structure Count**

Laboratory name:	EMSL27	E
Instrument	OL 100 CX II (27	. 1
Voltage (KV)	100kv	(C)
Magnification	19,000x	D
Grid opening area (mm2)	0.0130	Li
Scale: 1L=	1.000	L
Scale: 1D =	1.000	N
Primary filter area (mm2)	385.0	P
Secondary Filter Area (mm2)	360.0	Р
Category	Field	Ε
Filter Status	Analyzed 🔻	

	EPA Sample Number:	BA-00001		
-2)	Sample Type	Air	•	
	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1344		
	Date received by lab	4/14/2009		
	Lab Job Number:	270900045		
	Lab Sample Number:	270900045-000		
	Number of grids prepared	5		
	Prepared by	E.Wyatt-Pescado		
	Preparation date	4/15/20	09	
	EPA COC Number	L1498	4	

Analyzed by	R.Pescador		
Analysis date	4/16/2009		
Prep	Indirect	•	
ir sample type – air, is there loose material or debris in the cowl?	Yes	•	
Counting rules	ISO (Air or Dust)	•	
Grid storage location	2709-BNS-38	, A	
Archive filter(s) storage location	Westmont		
Enter the appropriate data in the cells calculate the F-factor >>>>	to the right to		
F- factor	0.25		
QA Type	Not QA	~	

#### Indirect Prep Inputs

F-factor Calculation:

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
50	Volume applied to secondary filter (mL) or used for serial dilution

#### Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

#### COMMENTS

Input f	or .	Ashing	of	Secondary	Filter
---------	------	--------	----	-----------	--------

Fraction of secondary filter used for ashing

0.25 F-factor

Grid opening traverse direction:	\	1

EPA SAMPLE ID: LAB SAMPLE ID: BA-00001 270900045-0001 Sample Type Air
Count Rule 10312

Prep Indirect

QA Type Not QA

ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 QA by: T. Peters
QA date: 4/21/2009

												:UI						

Grid Opening		Structure		tructures	Dimens		I do a difica di a a		Mineral (	Class (b)			1 = ye	s, blank	= no	Fract. GO
Gna	Opening	Туре	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.
1	J6	ND					Professional									
1	J8	ND														
1	J10	ND														
1	17	ND														
1	H2	ND							3		1					
1	H6	ND														
1	H8	ND					L. V.			1						
1	H10	ND														
1	G1	ND							<u> </u>							
1	G3	ND				- 124										
1	G5	ND							<u> </u>							
1	G7	ND								1						
1	G9	ND ND												and the second second		
1 1	F2 F4	ND ND										77.8				
1	F6	ND														
1	F8	ND		be a second	1524-1											
1	F10	ND		5.0								Time and the second				
1	E1	ND														5.5
1	E3	ND									-					
1	E5	ND														444
1	E7	ND						9.5					THE STREET			
1	E9	ND	786								1000		4376.39			
2	J2	ND		HET THE	100		25.00		10000	ALT AND	9,000		- 100			
2	J4	ND									200		100			
2	J6	ND			4.00			100		1.0						
2	J8	ND									all terms	<b>新兴福公司</b>				
2	G1	ND						<b>1975.79</b>		745.74						***
2	G3	ND			100				100	100			Es Proper			100
2	G5	ND				100								200		
2	G7	ND									3413			* 1		
2	G9	ND									<b>6</b> (4.2)					
2	C3	ND		-			Activities to the second			Per S						
2	C5	ND				<b>7</b>	200			9104						
2	C7	ND					400		ARTES.		1000					

3	17	ND	
3	19	ND	
3	F6	ND	
3	F8	ND	



#### SAMPLE ID

Status Overloaded
EPA Sample Number BA-00002
QA Type Not QA
Lab Sample Number 270900045-0002

Sample Type Air
Category Field
Prep Direct
Counting Rules 10312

**PARAMETERS** 

Effective filter area 385.0 mm2
Indirect factor 1.00E+00
Number of Grid Openings (amphibole) 0
Number of Grid Openings (chrysotile) 0
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 1333 L
Sensitivity (amphibole) s/cc

Sensitivity (chrysotile) s/cc
Area Examined (amphibole) 0.000 mm2
Area Examined (chrysotile) 0.000 mm2

Recording<br/>Rules:Min. ARMin length (um)Min width (um)≥ 3:10.5none

 Stopping
 Target S
 Max GOs
 Max N

 Rules:
 0.0024
 50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		ļ
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

 Check
 OK
 OK
 OK

 Grand total
 0
 OK

#### CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
e	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=,5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE TYPE: Original

#### Recording Rules:

#### Stopping Rules:

≥ 3:1	•	Minimum Aspect Ratio	0.00240	Target Sensitivity		
0.5	0	Minimum Length (um)	10	GOs required to react target sensitivity		
none		Minimum Width (um)		Maximum # of GOs		
			50	Maximum # of Structur		

Estimated # of GOs

#### **TEM Asbestos Structure Count**

Laboratory name:	EMSL27		
Instrument	OL 100 CX II (27		
Voltage (KV)	100kv		
Magnification	19,000x		
Grid opening area (mm2)	0.0130		
Scale: 1L=	1.000		
Scale: 1D =	1.000		
Primary filter area (mm2)	385.0		
Secondary Filter Area (mm2)	360.0		
Category	Field 🔻		
Filter Status	Overloaded 🔻		

		y,ih. i		
	EPA COC Number	L1498	34	QA T
	Preparation date			F- fac
	Prepared by			
	Number of grids prepared			Archi
	Lab Sample Number:	ber: 27090004		Grid s
	Lab Job Number:	270900	045	Coun
	Date received by lab	4/14/20	009	
	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1333	3	Prep
7-2	Sample Type	Air	-	Analy
	EPA Sample Number:	BA-000	002	Analy

4	Grid storage location	1
	If and storage location	
	Counting rules	ISO (Air or Dust)
	In sample type — air, is there loose material or debris in the cowl?	Yes 🔻
	Analysis date Prep	Direct 🔻
ı		1

## F-factor Calculation: Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Input for Ashing of Secondary Filter

Fraction of secondary	filter used for ashin	g
F-factor		
Grid opening traverse direction:		

#### COMMENTS

	Overloaded	
ı		

EPA SAMPLE ID: LAB SAMPLE ID:

BA-00002 270900045-0002 Sample Type Air
Count Rule 10312

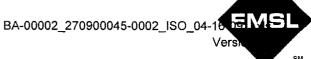
Prep Direct
QA Type Not QA

ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 QA by: T. Peters
QA date: 4/21/2009

Grid	Grid	Structure	No. of S	tructures	Dimens	ions (a)	Identification		Mineral C	lass (b)			1 = ye	s, blank	= no	Fract. GO
Gild	Opening	Туре	Primary	Total	Length	Width	identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.
														:		



#### SAMPLE ID

Status Analyzed BA-00002 **EPA Sample Number** QA Type Not QA

270900045-0002 Lab Sample Number

Sample Type Air Category Field Prep Indirect Counting Rules 10312

#### **PARAMETERS**

Effective filter area 360.0 mm2 Indirect factor 1.25E-01 Number of Grid Openings (amphibole) 39 Number of Grid Openings (chrysotile) 39 Grid opening area 0.013 mm2 Volume (L) or Area (cm2) 1333 L Sensitivity (amphibole) 4.26E-03 s/cc Sensitivity (chrysotile) 4.26E-03 s/cc

Area Examined (amphibole) 0.507 mm2 Area Examined (chrysotile) 0.507 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping Rules:

Target S	Max GOs	Max N		
0.0024	39	50		

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK Grand total 0 OK

#### CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td><b>.</b></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><b>.</b></td><td></td></dl<></td></dl<>	<dl< td=""><td><b>.</b></td><td></td></dl<>	<b>.</b>	
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00002\_270900045-0002\_ISO\_04-16-09\_I.xls

4/21/2009, 4:02 PM

FILE NAME: BA-00002\_270900045-0002\_ISO\_04-16-09\_1.xls

FILE TYPE: Original

### BNSF 2008 Libby Site Investigation v33

### **TEM Asbestos Structure Count**

Laboratory name:	EMSL27		
Instrument	OL 100 CX II (27		
Voltage (KV)	100kv		
Magnification	19,000x		
Grid opening area (mm2)	0.0130		
Scale: 1L =	1.000		
Scale: 1D =	1.000		
Primary filter area (mm2)	385.0		
Secondary Filter Area (mm2)	360.0		
Category	Field		
Filter Status	Analyzed		

EPA Sample Number: BA-00002				
Sample Type	Air	•		
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1333			
Date received by lab	4/14/20	09		
Lab Job Number:	270900	045		
Lab Sample Number:	27090004	5-0002		
Number of grids prepared	5			
Prepared by	E.Wyatt-Pe	scador		
Preparation date	4/15/20	109		
EPA COC Number	L1498	34		
	Sample Type  Air volume (L), dust sample area (cm2), or dustfall container area (cm2)  Date received by lab  Lab Job Number:  Lab Sample Number:  Number of grids prepared  Prepared by  Preparation date	Sample Type         Air           Air volume (L), dust sample area (cm2), or dustfall container area (cm2).         1333 (cm2)           Date received by lab         4/14/20           Lab Job Number:         2709000           Lab Sample Number:         270900048           Number of grids prepared         5           Prepared by         E.Wyatt-Perpared           Preparation date         4/15/20		

Analyzed by	R. Pescad	R. Pescador		
Analysis date	4/16/2009	9		
Prep	Indirect	•		
ir sample type – air, is there loose material or debris in the cowl?	Yes	•		
Counting rules	ISO (Air or Dust)	•		
Grid storage location	2709-BNS-38, B			
Archive filter(s) storage location	Westmon	it		
Enter the appropriate data in the cells calculate the F-factor >>>>	to the right to			
F- factor	0.125			
QA Type	Not QA	•		

### Recording Rules:

## Stopping Rules:

		-		-
≥ 3:1	•	Minimum Aspect Ratio	0.002.10	Target Sensitivity
0.5	0	Minimum Length (um)		GOs required to reach target sensitivity
non	те	Minimum Width (um)	39	Maximum # of GOs
			50	Maximum # of Structure
		1-1 b-42	39	Estimated # of GOs

### F-factor Calculation:

#### Indirect Prep Inputs

	0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	100	First resuspension volume or rinsate volume (mL)
_	25	Volume applied to secondary filter (mL) or used for serial dilution

#### Inputs for Serial Dilutions

mpats for	ocha onations
	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

#### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

0.125 F-factor

Grid ope	ening traverse	direction:	V

C	0	M	M	E	N	T	S
_						_	

EPA SAMPLE ID: BA-00002 LAB SAMPLE ID: 270900045=0002 Sample Type Air
Count Rule 10312

Prep Indirect
QA Type Not QA

ERROR CHECK

OK - No errors found

Data Entry by: L.Ramowski
Data Entry date: 4/20/2009

QA by: QA date: T. Peters 4/21/2009

Maximum # of Grid Openings Reached-Complete current GO then stored
--

Grid	Grid	Structure	S Reached No. of S		Dimens		Identification		Mineral C	Class (b)			1 = y	es, blank	= no	Fract. GO
GHQ	Opening	Туре	Primary	Tota!	Length	Width	Identification	LA	OA	С	NAM	Comments	Sketch			Chrys.
1	J2	ND														
1	J4	ND														
1	J6	ND											il.			
1	J8	ND													1000	
1	13	ND			i Carania de la Carania de							26.5				
1	15	ND								4						
11	. 17	ND														
1	H2	ND				ga Var										
1	H4	ND														
1	H6	ND				L								1000		
1	H8	ND														
11	H10	ND							2							<u> </u>
1	G3	ND			-					4						
1	G5	ND														
1	G7	ND	4.00			k Kara	<u> </u>				100					
1	G9 E2	ND ND														
1	E4	ND ND				5.41	<u> </u>									
1	E6	ND									2010					
1	E8	ND														
1	E10	ND	Part of the				100									
1	D1	ND												e de la comp		
1	D3	ND														
1	D5	ND							14.54							
1	D7	ND												4		
2	J2	ND					12.74								-	4.5
2	J4	ND									147.00					
2	J6	ND				14.72				(#1168)	100	Take the second	To Contract	100	1000	
2	J8	ND					e tra							e de la constitución de la const		200
2	J10	ND							100				100			
2	i1	ND				100										
2	13	ND														
2	15	ND			100							The second second				
2	17	ND		POPER I					1990				1.00			
2	19	ND											1000			

2	H2	ND	
2	H4	ND	
2	H6	ND	
2	Н8	ND	

0.234 mm2

# BNSF 2008 Libby Site Investigation v33 TEM Asbestos Structure Count -- ISO 10312

#### **SAMPLE ID**

Status Analyzed
EPA Sample Number BA-00011
QA Type Not QA

Lab Sample Number 270900045-0003

Sample Type Air
Category Field
Prep Direct
Counting Rules 10312

#### **PARAMETERS**

Effective filter area 385.0 mm2 Indirect factor 1.00E+00 Number of Grid Openings (amphibole) 18 Number of Grid Openings (chrysotile) 18 Grid opening area 0.013 mm2 Volume (L) or Area (cm2) 706 L Sensitivity (amphibole) 2.33E-03 s/cc 2.33E-03 s/cc Sensitivity (chrysotile) Area Examined (amphibole) 0.234 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping Rules:

Area Examined (chrysotile)

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK OK Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	ď	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00011\_270900045-0003\_ISO\_04-16-09\_D.xls

4/21/2009, 4:06 PM

FILE NAME: BA-00011 270900045-0003 ISO 04-16-09 Dixis

FILE TYPE: Original

#### Recording Rules:

#### Stopping Rules:

Treoriting trains.		Otopping t	tuics.		
	≥ 3:1	•	Minimum Aspect Ratio	0.00240	Target Sensitivity
	0.5	0	Minimum Length (um)	1 1 D	GOs required to reach target sensitivity
•	non	e	Minimum Width (um)		Maximum # of GOs
				50	Maximum # of Structure
				18	Estimated # of GOs

# F-factor Calculation:

#### Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial

#### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Input for Ashing of Secondary Filter

Fraction of	secondary	tilter	used	tor	ashing	

F-factor

Grid opening traverse direction:

٧

## BNSF 2008 Libby Site Investigation v33 **TEM Asbestos Structure Count**

Laboratory name:	EMSL27	EPA Sample Number:	BA-00011	
Instrument	OL 100 CX II (27-2	Sample Type	Air 🔻	
Voltage (KV)	100kv	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	706	
Magnification	19,000x	Date received by lab	4/14/2009	
Grid opening area (mm2)	0.0130	Lab Job Number:	270900045	
Scale: 1L =	1.000	Lab Sample Number:	270900045-000	
Scale: 1D =	1.000	Number of grids prepared	5	
Primary filter area (mm2)	385.0	Prepared by	E.Wyatt-Pescado	
Secondary Filter Area (mm2)	360,0	Preparation date	4/15/2009	
Category	Field	EPA COC Number	L14984	
Filter Status	Analyzed 🔻			

Analyzed by	R. Pescador
Analysis date	4/16/2009
Prep	Direct 🔻
ir sample type – air, is there loose material or debris in the cowl?	No 🔻
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, C
Archive filter(s) storage location	Westmont
en de la companya de La companya de la co	
F- factor	1
QA Type	Not QA

COMMENTS

EPA SAMPLE ID: BA-00011 LAB SAMPLE ID: 270900045-0003 Sample Type Air
Count Rule 10312

Prep Direct
QA Type Not QA

ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 QA by: T. Peters 4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

	Grìd	Structure		tructures	Dimens	<del></del>	Identification		Mineral Class (b)				1 = ye	s, blank	= no	Fract. GO
Grid	Opening	Туре	Primary	Total	Length	Width	identification	LA	OA	С		Comments	Sketch	Photo	EDS	Chrys.
1	J1	ND														
1	J3	ND														
1	J5	ND														
1	J7	ND														
1	J9	ND														
1	12	ND														
1	14	ND														
1	16	ND														
1	G2	ND														
11	G4	ND														
2	G1	ND												100		
2	G3	ND								9500	1000					
2	G5	ND										AND DESCRIPTION		110		
2	G7	ND	40.00								1924					
2	G9	ND								<b>*</b>	100 B					
2	E2	ND		15 (15 <b>17 %</b> )					100							
2	E4	ND		16671302							28.62			100		
2	E6	ND					100		100	<b>6</b> + 3					76 76	

#### SAMPLE ID

Status Analyzed
EPA Sample Number BA-00012
QA Type Not QA

Lab Sample Number 270900045-0004

Sample Type Air
Category Field
Prep Direct
Counting Rules 10312

#### **PARAMETERS**

Effective filter area 385.0 mm2 Indirect factor 1.00E+00 Number of Grid Openings (amphibole) 18 Number of Grid Openings (chrysotile) 18 Grid opening area 0.013 mm2 Volume (L) or Area (cm2) 687 L Sensitivity (amphibole) 2.39E-03 s/cc Sensitivity (chrysotile) 2.39E-03 s/cc

Area Examined (chrysotile)

2.39E-03 s/cc

0.234 mm2

Area Examined (chrysotile)

0.234 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
Grand total 0 OK

#### CONCENTRATION (s/cc)

Bin	LA	OA_	С	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	C		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00012\_270900045-0004\_ISO\_04-16-09\_D.xls

4/21/2009, 4:17 PM

FILE NAME: BA-00012 270900045-0004 ISO 04-16-09 D.xls

FILE TYPE: Original

#### Recording Rules:

#### Stopping Rules:

_					<del></del>
	≥ 3:1	▼.	Minimum Aspect Ratio	4.442.4	Target Sensitivity
0.50 Mini		0	Minimum Length (um)		GOs required to reach target sensitivity
none		e	Minimum Width (um)		Maximum # of GOs
				50	Maximum # of Structure

Estimated # of GOs

#### F-factor Calculation:

Indirect Prep Inputs									
Fraction of primary filter used for indirect prep or ashing									
[For dust and dustfall, enter 1.0]									

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Input for Ashing of Secondary Filter

Fraction	of	second	dary	filter	used	for	ashii	ng

F-factor

Grid opening traverse direction:

٧

# BNSF 2008 Libby Site Investigation v33 **TEM Asbestos Structure Count**

Laboratory name:	EMSL27	EPA Sample Number:	BA-00012	
Instrument	OL 100 CX II (2	7-2 Sample Type	Air	
Voltage (KV)	100kv	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	687	
Magnification	19,000x	Date received by lab	4/14/2009	
Grid opening area (mm2)	0.0130	Lab Job Number:	270900045	
Scale: 1L =	1.000	Lab Sample Number:	270900045-0004	
Scale: 1D =	1.000	Number of grids prepared	5	
Primary filter area (mm2)	385.0	Prepared by	E.Wyatt-Pescado	
Secondary Filter Area (mm2)	360.0	Preparation date	4/15/2009	
Category	Field	EPA COC Number	L14984	
Filter Status	Analyzed 🔻			

	Analyzed by	R. Pescador		
1	Analysis date	4/16/2009		
	Prep	Direct		
	If sample type = air, is there loose material or debris in the cowl?	No 🔻		
	Counting rules	ISO (Air or Dust)		
4	Grid storage location	2709-BNS-38, D		
	Archive filter(s) storage location	Westmont		
or	en e	* .		
	F- factor	1		
	QA Type	Not QA		

#### COMMENTS

EPA SAMPLE ID: LAB SAMPLE ID:

BA-00012 270900045-0004 Sample Type Air
Count Rule 10312

Prep Direct
QA Type Not QA

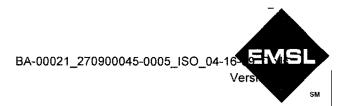
ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 QA by: T.Peters
QA date: 4/21/2009

A CONTRACTOR OF THE PROPERTY O				
Tarant Constitute	Dogshad	Camplatoni	creant CO th	an otan
Target Sensitivit	y (\caciicu-	Complete C	uiiciii 00. iii	CII SLUD.

Grid	Grid	Structure	No. of S	tructures	Dimens	ions (a)	Identification		Mineral C	lass (b)			1 = ye	s, blank =	no no	Fract. GO
Gilu	Opening	Туре	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.
1	J2	ND														
1	J4	ND														
1	J6	ND						Y								
1	J8	ND									1000					
1	F2	ND														
1	F4	ND														
1	F6	ND														
1	F8	ND :								Cell Const				2019		
1	F10	ND												y y g		
2	12	ND						Carrier Co.								
2	14	ND														
2	16	ND														
2	18	ND														
2	110	ND														
2	E1	ND														
2	E3	ND			<b>8</b> 8 8 8											
2	E5	ND														
2	<b>E</b> 7	ND							464		(F) (F)					



#### SAMPLE ID

Status Analyzed
EPA Sample Number BA-00021
QA Type Not QA

Lab Sample Number 270900045-0005

Sample Type Air
Category Field
Prep Direct
Counting Rules 10312

#### **PARAMETERS**

Effective filter area 385.0 mm2 Indirect factor 1.00E+00 Number of Grid Openings (amphibole) 13 Number of Grid Openings (chrysotile) 13 Grid opening area 0.013 mm2 Volume (L) or Area (cm2) 988 L Sensitivity (amphibole) 2.31E-03 s/cc Sensitivity (chrysotile) 2.31E-03 s/cc

Area Examined (amphibole)

Area Examined (chrysotile)

0.169 mm2

0.169 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping Rules:

Target S	Max GOs	Max N		
0.0024		50		

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)					
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>							
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>							
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>							
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>							
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>							
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>							
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl.< td=""><td><dl< td=""></dl<></td></dl.<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl.< td=""><td><dl< td=""></dl<></td></dl.<></td></dl<></td></dl<>	<dl< td=""><td><dl.< td=""><td><dl< td=""></dl<></td></dl.<></td></dl<>	<dl.< td=""><td><dl< td=""></dl<></td></dl.<>	<dl< td=""></dl<>					

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00021 270900045-0005 ISO 04-16-09 D.xis

FILE TYPE: Original

### BNSF 2008 Libby Site Investigation v33

#### **TEM Asbestos Structure Count**

Laboratory name:	EMSL27		
Instrument	OL 100 CX II (27-		
Voltage (KV)	100kv		
Magnification	19,000x		
Grid opening area (mm2)	0.0130		
Scale: 1L =	1.000		
Scale: 1D =	1.000		
Primary filter area (mm2)	385.0		
Secondary Filter Area (mm2)	n2) 360.0		
Category	Field		
Filter Status	Analyzed 🔻		

COMMENTS

	EPA Sample Number:	Number: BA-00021				
-2)	Sample Type	Air	•			
	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	988				
	Date received by lab	4/14/2009				
	Lab Job Number:	2709000	270900045			
	Lab Sample Number:	270900045-000				
	Number of grids prepared	5				
	Prepared by	E.Wyatt-Pescador				
	Preparation date	4/15/20	09			
	EPA COC Number	L14984				
ľ						

Analyzed by	R. Pescador			
Analysis date	4/16/2009			
Prep	Direct 🔻			
ir sample type – air, is there loose material or debris in the	No 🔻			
Counting rules	ISO (Air or Dust)			
Grid storage location	2709-BNS-38, E			
Archive filter(s) storage location	Westmont			
F- factor				
QA Type	Not QA			

#### Recording Rules:

#### Stopping Rules:

	117.7.1		1	A LE PRINT	IMIQQI
and the same	≥ 3:1	•	Minimum Aspect Ratio	0.00240	Target Sensitivity
	0.5	0	Minimum Length (um)	13	GOs required to reach target sensitivity
	nor	ne	Minimum Width (um)		Maximum # of GOs
				50	Maximum # of Structure
				13	Estimated # of GOs

#### F-factor Calculation:

#### Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial

#### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

٧

EPA SAMPLE ID: LAB SAMPLE ID: BA-00021 270900045-0005 Sample Type Count Rule 10312

Prep Direct
QA Type Not QA

ERROR CHECK
OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 QA by: T. Peters
QA date: 4/21/2009

	Reached-Compl	

Taidore				current G				i					_			
Grid	Grid	Structure	No. of S	tructures	Dimens	ions (a)	Identification		Mineral C	lass (b)			1 = ye	s, blank	= no	Fract. GO
Ond	Opening	Type	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.
1	J5	ND														
1	J7	ND														
1	J9	ND														
1	H7	ND														2.7
1	H9	ND														
1	<b>D</b> 7	ND					i v						1			
1	D9	ND														
2	G1	ND														
2	G3	ND														
2	G5	ND														
2	G7	ND										18.50 E 18.00 (19.00 E 19.00 E				
2	C8	ND		E												
2	C10	ND											1			



#### **SAMPLE ID**

Status Analyzed BA-00022 EPA Sample Number Not QA QA Type 270900045-0006

Lab Sample Number Sample Type

Air Field Category Prep Direct 10312 Counting Rules

#### **PARAMETERS**

Rules:

Effective filter area 385.0 mm2 Indirect factor 1.00E+00 Number of Grid Openings (amphibole) 13 Number of Grid Openings (chrysotile) 13 Grid opening area 0.013 mm2 Volume (L) or Area (cm2) 1016 L

Sensitivity (amphibole) 2.24E-03 s/cc Sensitivity (chrysotile) 2.24E-03 s/cc Area Examined (amphibole) 0.169 mm2 Area Examined (chrysotile) 0.169 mm2

Target S

0.0024

Stopping

Max GOs Max N

50

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

OK

### COUNTS (based on countable structures only)

0

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0
Check	OK	OK	OK		

CONCENTRATION (s/cc)

Grand total

CONCENTION	1011 (0,00)				
Bin	LA	OA	С	PCME(all)	PCME(asb)
a	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00022 270900045-0006 ISO 04-17-09 D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v33

#### **TEM Asbestos Structure Count**

Laboratory name:	EMSL27		
Instrument	OL 100 CX II (27		
Voltage (KV)	100kv		
Magnification	19,000x		
Grid opening area (mm2)	0.0130		
Scale: 1L =	1.000		
Scale: 1D =	1.000		
Primary filter area (mm2)	385.0		
Secondary Filter Area (mm2)	360.0		
Category	Field 🔻		
Filter Status	Analyzed 🔻		

COMMENTS

	EPA Sample Number:	BA-00022		
2)	Sample Type	Air 🔻		
	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1016		
	Date received by lab	4/14/2009		
	Lab Job Number:	270900045		
	Lab Sample Number:	270900045-0006		
	Number of grids prepared	5		
	Prepared by	E.Wyatt-Pescado		
	Preparation date	4/15/2009		
	EPA COC Number	L14984		

Analyzed by R. Pescador			
Analysis date	4/17/2009	,	
Prep	Direct		
If sample type – air, is there loose material or debris in the cowl?	No	•	
Counting rules	ISO (Air or Dust)	•	
Grid storage location	2709-BNS-38, F		
Archive filter(s) storage location	Westmont		
and the second s			
F- factor			
QA Type	Not QA	•	

#### **Recording Rules:**

≥ 3:1

# Stopping Rules:

Estimated # of GOs

3:1	li	Minimum Aspect Ratio Minimum Length (um)		Target Sensitivity GOs required to reach target sensitivity
none		Minimum Width (um)		Maximum # of GOs
			50	Maximum # of Structure

#### F-factor Calculation:

#### **Indirect Prep Inputs**

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial

#### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

٧

EPA SAMPLE ID: BA-00022 LAB SAMPLE ID: 270900045-0006 Sample Type Air
Count Rule 10312

Prep Direct
QA Type Not QA

ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 QA by: T.Peters 4/21/2009

		GO, then stop.

Grid	Grid	Structure		tructures	Dimens		ons (a) Identification		Identification Mineral Class (b)			1 = yes, blank = no		no no	Fract. GO	
Gila	Opening	Туре	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.
1	18	ND														
1	H9	ND											A company of the contract of t			
1	F7	ND														
1	D5	ND														
1	D7	ND														
1	C8	ND														
1	C10	ND														
2	H1	ND														
2	H3	ND														
2	H5	ND														
2	H7	ND														
2	D7	ND										2.20年 美国				
2	D9	ND						2.01			Bullet a					

SAMPLE ID

Status

Prep

QA Type

Analyzed BA-00029 Not QA

270900045-0007

Lab Sample Number

**EPA Sample Number** 

Sample Type Air Category Field Direct Counting Rules 10312 **PARAMETERS** 

Effective filter area 385.0 mm2 1.00E+00 Indirect factor Number of Grid Openings (amphibole) 11 Number of Grid Openings (chrysotile) 11 Grid opening area 0.013 mm2

Volume (L) or Area (cm2) 1145 L Sensitivity (amphibole) 2.35E-03 s/cc Sensitivity (chrysotile) 2.35E-03 s/cc

Area Examined (amphibole) 0.143 mm2 Area Examined (chrysotile) 0.143 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping Rules:

Target S	Max GOs	Max N
0.0024	-	50

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td> </td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td> </td><td></td></dl<></td></dl<>	<dl< td=""><td> </td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td>ļ</td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>ļ</td><td></td></dl<></td></dl<>	<dl< td=""><td>ļ</td><td></td></dl<>	ļ	
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	C		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
Ī	е	5 to 10	<=.5	>= 5
Ī	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00029\_270900045-0007\_ISO\_04-17-09\_D.xls

FILE NAME: BA-00029 270900045-0007 ISO 04-17-09 D.xls

FILE TYPE: Original

#### BNSF 2008 Libby Site Investigation v33

#### **TEM Asbestos Structure Count**

Laboratory name:	EM\$L27		EPA Sample Number:	BA-00029	
Instrument	OL 100 CX	II (27-2	Sample Type	Air	•
Voltage (KV)	100kv	′	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1145	
Magnification	19,000	x	Date received by lab	4/14/2	009
Grid opening area (mm2)	0.0130	0	Lab Job Number:	27090	0045
Scale: 1L =	1.000		Lab Sample Number:	270900045-0007	
Scale: 1D =	1.000		Number of grids prepared	5	
Primary filter area (mm2)	385.0		Prepared by	E.Wyatt-Pescad	
Secondary Filter Area (mm2)	360.0		Preparation date	4/15/2009	
Category	Field	•	EPA COC Number	L149	84
Filter Status	Analyzed	•			

R. Pescador
4/17/2009
Direct
No 🔻
ISO (Air or Dust)
2709-BNS-38, G
Westmont
1
Not QA

#### Recording Rules:

#### Stopping Rules:

≥ 3:1 ▼	Minimum Aspect Ratio Minimum Length (um)	10.002.10	Target Sensitivity GOs required to reach
none	Minimum Width (um)		target sensitivity Maximum # of GOs
		50	Maximum # of Structure
			Fetimated # of GOs

#### F-factor Calculation:

#### Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing F-factor

Grid opening traverse direction:

٧

#### **COMMENTS**

EPA SAMPLE ID: LAB SAMPLE ID:

BA-00029 270900045-0007 Sample Type Air
Count Rule 10312

Prep Direct
QA Type Not QA

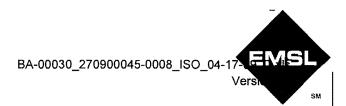
ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 QA by: T. Peters
QA date: 4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid	Structure	No. of St	tructures	Dimens	ions (a)	Identification	tification Mineral Class (b)			1 = ye	s, blank	= no	Fract. GO		
Grid	Opening	Туре	Primary	Totai	Length	Width	Identification	LA			M Comments Sketch PI		Photo	EDS	Chrys.	
1	J3	ND														
1	J5	ND														
1	J7	ND		Marian and a second												
1	<b>J</b> 9	ND														
1	C7	ND														
1	C9	ND														
2	J6	ND														
2	J8	ND								le la						
2	J10	ND														
2	D7	ND														
2	<b>D</b> 9	ND											aQ.			



**SAMPLE ID** 

Status

QA Type

Analyzed **EPA Sample Number** BA-00030 Not QA

Lab Sample Number 270900045-0008 Sample Type Air Category Field Prep Direct 10312 Counting Rules

**PARAMETERS** 

Effective filter area 385.0 mm2 Indirect factor 1.00E+00 Number of Grid Openings (amphibole) 11 Number of Grid Openings (chrysotile) 11 Grid opening area 0.013 mm2

Volume (L) or Area (cm2) 1145 L Sensitivity (amphibole) 2.35E-03 s/cc Sensitivity (chrysotile) 2.35E-03 s/cc Area Examined (amphibole) 0.143 mm2

Area Examined (chrysotile) 0.143 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)	
≥ 3:1	0.5	none	

Stopping Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0
Check	OK	OK	OK		

Check OK OK OK Grand total 0

CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00030 270900045-0008 ISO 04-17-09 D.xls

FILE NAME: BA-00030 270900045-0008 ISO 04-17-09 D.xis

FILE TYPE: Original

### BNSF 2008 Libby Site Investigation v33

### **TEM Asbestos Structure Count**

Laboratory name:	EMSL27		EPA Sample Number:						
Instrument	OL 100 C)	K II (27-2	Sample Type						
Voltage (KV)	100kv		100kv		100kv		100kv		Air volume (L), dust sample area (cm2), or dustfall container area (cm2)
Magnification	19,00	0x	Date received by lab						
Grid opening area (mm2)	0.0130		0.0130		Lab Job Number:				
Scale: 1L =	1.00	0	Lab Sample Number:						
Scale: 1D =	1.00	0	Number of grids prepared						
Primary filter area (mm2)	385.	0	Prepared by						
Secondary Filter Area (mm2)	360.0		Preparation date						
Category	Field 🔻		EPA COC Number						
Filter Status	Analyzed	•							

BA-000	30	Ana
Air	•	Ana
1145		Pre
4/14/20	109	
270900	045	Cou
27090004	5-0008	Grid
5		Arch
E.Wyatt-Pe	scador	
4/15/20	109	F- fa
L1498	34	QA
	Air 1145 4/14/20 270900045 5 E.Wyatt-Pe	1145 4/14/2009 270900045 270900045-0008

Analyzed by	R. Pescador
Analysis date	4/17/2009
Prep	Direct
It sample type – air, is there loose material or debris in the	No 🔻
Counting rules	ISO (Air or Dust)
Grid storage location	2709-BNS-38, H
Archive filter(s) storage location	Westmont
F- factor	1.
QA Type	Not QA

### Recording Rules:

### Stopping Rules:

≥ 3:1	•	Minimum Aspect Ratio	0.002.10	Target Sensitivity		
0.5	0.50 Minimum Length (um)			GOs required to reach target sensitivity		
nor	ne	Minimum Width (um)		Maximum # of GOs		
			50	Maximum # of Structure		
F-fact	or C	alculation:	11	Estimated # of GOs		

### F-factor Calculation:

### **Indirect Prep Inputs**

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

٧

EPA SAMPLE ID: LAB SAMPLE ID: BA-00030 270900045-0008 Sample Type Air Count Rule 10312

QA by:

QA date:

Prep Direct
QA Type Not QA

ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 T. Peters 4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid	Structure	No. of St	No. of Structures Dimensions (a)		No. of Structures		No. of Structures		No. of Structures		No. of Structures		No. of Structures		No. of Structures		ions (a)	Identification	Mineral Class (b)	Mineral Class (b)			1 = yes, blank = no		= no	Fract. GO
Gilu	Opening	Туре	Primary	Total	Length	Width	identification	LA			Comments	Sketch	Photo	EDS	Chrys.												
1	F2	ND																									
1	F4	ND																									
1	F6	ND																									
1	F8	ND																									
1	F10	ND																									
11	D6	ND																									
1	D8	ND																									
2	F1	ND																									
2	F3	ND		**************************************																							
2	F5	ND																									
2	F7	ND												A 10 (4)													



### SAMPLE ID

Status Overloaded
EPA Sample Number BA-00037
QA Type Not QA
Lab Sample Number 270900045-0009

Sample Type Air
Category Field
Prep Direct
Counting Rules 10312

**PARAMETERS** 

Effective filter area 385.0 mm2 Indirect factor 1.00E+00 Number of Grid Openings (amphibole) 0 Number of Grid Openings (chrysotile) 0 Grid opening area 0.013 mm2

Volume (L) or Area (cm2) 739 L
Sensitivity (amphibole) s/cc
Sensitivity (chrysotile) s/cc
Area Examined (amphibole) 0.000 mm2

Area Examined (chrysotile) 0.000 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00037\_270900045-0009\_ISO\_D.xis

4/21/2009, 4:44 PM

FILE NAME: BA-00037 270900045-0009 ISO D.xls

FILE TYPE: Original

### Recording Rules:

### Stopping Rules:

				141441
≥ 3:1	•	Minimum Aspect Ratio		Target Sensitivity
0.5	0	Minimum Length (um)	17	GOS required to re target sensitivity
nor	e	Minimum Width (um)		Maximum # of GO

17	target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
17	Estimated # of GOs

### BNSF 2008 Libby Site Investigation v33 **TEM Asbestos Structure Count**

Laboratory name:	EMSL27					
instrument	OL 100 CX II (27-2					
Voltage (KV)	100kv					
Magnification	19,000x					
Grid opening area (mm2)	opening area (mm2) 0.0130					
Scale: 1L=	1.000					
Scale: 1D =	1.000					
Primary filter area (mm2)	385.0					
Secondary Filter Area (mm2)	360.0					
Category	Field					
Filter Status Overloaded						

EPA Sample Number: BA-00037							
2 Sample Type	• • • • • • • • • • • • • • • • • • • •						
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	739						
Date received by lab	4/14/2009						
Lab Job Number:	270900045						
Lab Sample Number:	270900045-000						
Number of grids prepared							
Prepared by							
Preparation date							
EPA COC Number	L14984						
	Policy - 15th						

Analyzed by	
Analysis date	
Prep	Direct 🔻
loose material or debris in the	Yes 🔻
Counting rules	ISO (Air or Dust)
Grid storage location	
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA
, in the plant of the service of the	The Add March 1995 and the

### Indirect Prep Inputs

F-factor Calculation:

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

### Input for Ashing of Secondary Filter

Fraction o	secondary filter	used	for ashing
------------	------------------	------	------------

F-factor

rid openir	ng traverse	direction:
------------	-------------	------------

### COMMENTS

Overloaded

EPA SAMPLE ID: LAB SAMPLE ID: BA-00037 270900045-0009 Sample Type Air
Count Rule 10312

Prep Direct
QA Type Not QA

ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 QA by: QA date:

T. Peters 4/21/2009

Grid	Grid	Structure	No. of S	tructures	Dimens	ions (a)	Identification	1	Mineral C	lass (b)			1 = ye	s, blank	= no	Fract. GO
Gila	Opening	Туре	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.

### 4-1) FMSL Versi

## BNSF 2008 Libby Site Investigation v33 TEM Asbestos Structure Count -- ISO 10312

### SAMPLE ID

Status Analyzed
EPA Sample Number BA-00037
QA Type Not QA

Lab Sample Number 270900045-0009

Sample Type Air
Category Field
Prep Indirect
Counting Rules 10312

### **PARAMETERS**

Effective filter area 360.0 mm2 Indirect factor 1.25E-01 Number of Grid Openings (amphibole) 39 Number of Grid Openings (chrysotile) 39 Grid opening area 0.013 mm2 Volume (L) or Area (cm2) 739 L Sensitivity (amphibole) 7.69E-03 s/cc Sensitivity (chrysotile) 7.69E-03 s/cc

Sensitivity (chrysotile) 7.6
Area Examined (amphibole)

Area Examined (chrysotile)

0.507 mm2 0.507 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping Rules:

Target S	Max GOs	Max N
0.0024	39	50

**COUNTS** (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
Grand total 0 OK

### CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00037\_270900045-0009\_ISO\_04-17-09\_I.xls

4/21/2009, 4:47 PM

FILE NAME: BA-00037\_270900045-0009\_ISO\_04-17-09\_I.xls

FILE TYPE: Original

### BNSF 2008 Libby Site Investigation v33

### **TEM Asbestos Structure Count**

Laboratory name:	EMSL27		
Instrument	OL 100 CX II (27		
Voltage (KV)	100kv		
Magnification	19,000x		
Grid opening area (mm2)	0.0130		
Scale: 1L =	1.000		
Scale: 1D =	1.000		
Primary filter area (mm2)	385.0		
Secondary Filter Area (mm2)	360.0		
Category Field			
Filter Status	Analyzed <b>T</b>		

ole Number:	BA-00037	
/ре	Air 🔻	
(L), dust sample area ustfall container area	739	
ved by lab	4/14/2009	
umber:	270900045	
le Number:	270900045-0009	
grids prepared	5	
ру	E.Wyatt-Pescado	
n date	4/15/2009	
Number	L14984	
	vpe (L), dust sample area strail container area ved by lab umber: le Number: grids prepared by	/pe

Analyzed by	R. Pescador 4/17/2009		
Analysis date			
Prep	Indirect	~	
If sample type – all, is there loose material or debris in the cowl?	Yes	~	
Counting rules	ISO (Air or Dust)	•	
Grid storage location	2709-BNS-38, I		
Archive filter(s) storage location	Westmont		
Enter the appropriate data in the cells calculate the F-factor >>>>	to the right to		
F- factor	0.125		
QA Type	Nat QA	•	

### Recording Rules:

### Stopping Rules:

	≥ 3:1	Minimum Aspect Ratio	0.00240	Target Sensitivity
	0.50	Minimum Length (um)	1.75	GOs required to reach target sensitivity
	none	Minimum Width (um)	39	Maximum # of GOs
		50	Maximum # of Structure	
	F-factor Calculation:		39	Estimated # of GOs

### F-factor Calculation:

### Indirect Prep Inputs

L	0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	100	First resuspension volume or rinsate volume (mL)
	25	Volume applied to secondary filter (mL) or used for serial dilution

### Inputs for Serial Dilutions

1110000 101	Serial Bilacions				
	Second resuspension volume (mL)				
	Volume applied to secondary filter (mL) or used for serial dilution				
	Third resuspension volume (mL)				
	Volume applied to secondary filter (mL) or used for serial dilution				

### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

0.125 F-factor

Grid opening traverse direction:

٧

BA-00037 EPA SAMPLE ID: LAB SAMPLE ID: 270900045-0009

Sample Type Air Count Rule 1031 10312

Indirect Prep QA Type Not QA

ERROR CHECK OK - No errors found

Data Entry by: Data Entry date:

L.Ramowski 4/20/2009

T. Peters QA by: 4/21/2009 QA date:

The second secon	The second second second		"EXPONENTIAL STATES	6.250 P. C.	the second section of the second
Maximum # o	of Grid Openi	nos Reached-C	omplete	current GO ti	nen stop.

	um # of Grid Openings Reached-Complete current GO Grid Structure No. of Structures Dimensions					Mineral Class (b)				1 = v		es, blank = no F		Fract. GO		
Grid	Opening	Туре	Primary	Total	Length	Width	Identification	LA	OA	С		Comments	Sketch	Photo	EDS	Chrys.
1	J1	ND														
1	J3	ND														
1	J5	ND														
1	J7	ND	i i i i i i i i i i i i i i i i i i i													
1	J9	ND														
1	12	ND														
1	4	ND														27.
1	16	ND														
1	18	ND														
11	110	ND														
11	H2	ND		4.4.4.4.4												
1	H4	ND														
1	H6	ND														
11	H8	ND														
1	H10	ND														
1	G2	ND							2.30	LE SALE						
1	G4	ND						42								
1	G6	ND						ar abutin					3 (4)			
1	G8	ND														
1	G10	ND						- 2								
2	12	ND														800
2	14	ND								<u> </u>						
2	16	ND					Section 1									
2	18	ND										San				
2	110	ND					A CONTRACTOR OF THE CONTRACTOR	Company of the Company								
2	H1	ND					1.0									
2	H3 H5	ND					ļ ————————————————————————————————————									
2	H7	ND ND								l						
2	H9	ND ND					3.00									
2	G2	ND ND						### ##################################	277.56		Electric de la constant de la consta	CONTRACTOR CONTRACTOR	200		k i	
2	G2 G4	ND												1000		
2	G6	ND					Company of the second									Tr.
2	G8	ND														4
2	G10	ND ND											1000			
	I GIO	ואט			V				Barren.	l ka		Secretary Comments of the Comm				

2	F1	ND	
2	F3	ND	
2	F5	ND	
2	• F7	ND	



### SAMPLE ID

Status Overloaded
EPA Sample Number BA-00038
QA Type Not QA
Lab Sample Number 270900045-0010

Sample Type Air
Category Field
Prep Direct
Counting Rules 10312

**PARAMETERS** 

Effective filter area 385.0 mm2
Indirect factor 1.00E+00
Number of Grid Openings (amphibole) 0
Number of Grid Openings (chrysotile) 0
Grid opening area 0.013 mm2

Volume (L) or Area (cm2)890 LSensitivity (amphibole)s/ccSensitivity (chrysotile)s/ccArea Examined (amphibole)0.000 mm2

Area Examined (chrysotile) 0.000 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK Grand total 0 OK

**CONCENTRATION (s/cc)** 

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5	-	>= 5
C = Chrysotile	C		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=,5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00038\_270900045-0010\_ISO\_D.xls

FILE NAME: BA-00038 270900045-0010 ISO D.xls

FILE TYPE: Original

### BNSF 2008 Libby Site Investigation v33

### **TEM Asbestos Structure Count**

Laboratory name:	EMSL27	EPA Sample Number:
Instrument	OL 100 CX II (27-2	Sample Type
Voltage (KV)	100kv	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)
Magnification	19,000x	Date received by lab
Grid opening area (mm2)	0.0130	Lab Job Number:
Scale: 1L=	1.000	Lab Sample Number:
Scale: 1D =	1.000	Number of grids prepared
Primary filter area (mm2)	385.0	Prepared by
Secondary Filter Area (mm2)	360.0	Preparation date
Category	Field 🔻	EPA COC Number
Filter Status	Overloaded 🔻	

-					
BA-00038		38	Analyzed by		
1	Air	•	Analysis date		
	890		Prep	Direct 🔻	
4/14/2009		09	loose material or debris in the	Yes	
	270900045		Counting rules	ISO (Air or Dust)	•
1	270900045-0010		Grid storage location		
T			Archive filter(s) storage location	Westmon	t -
Ī					
			F- factor		
	L1498	4	QA Type	Not QA	•
1	MEN CO.	, a 2.	The state of the s	ω1336-	

### **Recording Rules:**

### Stopping Rules:

	≥ 3:1	•	Minimum Aspect Ratio	0.00240	Target Sensitivity	
0.50		0	Minimum Length (um)	14	target sensitivity	
	none		Minimum Width (um)		Maximum # of GOs	
L			•	50	Maximum # of Structure	
	F-fact	or C	alculation:	14	Estimated # of GOs	

### F-factor Calculation:

### **Indirect Prep Inputs**

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

Overloaded		

EPA SAMPLE ID: LAB SAMPLE ID:

BA-00038 270900045-0010 Sample Type Air
Count Rule 10312

Prep Direct
QA Type Not QA

ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 QA by: T. Peters
QA date: 4/21/2009

1	1. Feleis	
I	4/21/2009	
ì		1

Grid	Grid	Structure	No. of S	tructures	Dimens	ions (a)	Identification		Mineral C	lass (b)			1 = ye	s, blank	= no	Fract. GO
	Opening	Туре	Primary	Total	Length	Width	identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.

0.507 mm2

### BNSF 2008 Libby Site Investigation v33 TEM Asbestos Structure Count -- ISO 10312

### SAMPLE ID

Status Analyzed
EPA Sample Number BA-00038
QA Type Not QA

Lab Sample Number 270900045-0010

Sample Type Air
Category Field
Prep Indirect
Counting Rules 10312

### **PARAMETERS**

Effective filter area 360.0 mm2 Indirect factor 2.50E-01 39 Number of Grid Openings (amphibole) Number of Grid Openings (chrysotile) 39 Grid opening area 0.013 mm2 Volume (L) or Area (cm2) 890 L Sensitivity (amphibole) 3.19E-03 s/cc Sensitivity (chrysotile) 3.19E-03 s/cc Area Examined (amphibole) 0.507 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

Stopping
Duloci

Area Examined (chrysotile)

Target S	Max GOs	Max N
0.0024	39	50

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0
Check	ОК	OK	OK		

Check OK OK Grand total 0 OK

### CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	C		>.5	>= 5
	d	>=.5 to < 5	<=,5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00038\_270900045-0010\_ISO\_04-17-09\_I.xls

4/21/2009, 5:08 PM

FILE NAME: BA-00038\_270900045-0010\_ISO\_04-17-09\_Lxls

FILE TYPE: Original

### Recording Rules:

### Stopping Rules:

		•		-
≥ 3:1	•	Minimum Aspect Ratio	0.002.10	Target Sensitivity
0.50		Minimum Length (um)		GOs required to reach target sensitivity
none		Minimum Width (um)	39	Maximum # of GOs
			50	Maximum # of Structure

Estimated # of GOs

### F-factor Calculation:

Indirect	Pren	Innuts
ILIMII OOL	up	шрыф

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
50	Volume applied to secondary filter (mL) or used for serial dilution

### Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
50	Volume applied to secondary filter (mL) or used for serial dilution

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

0.25	F-facto

Grid opening traverse direction:	V
----------------------------------	---

### BNSF 2008 Libby Site Investigation v33

### **TEM Asbestos Structure Count**

Laboratory name:	EMSL27	EP.
instrument	OL 100 CX II (27-2	Sar
Voltage (KV)	100kv	Air (cm (cm
Magnification	19,000x	Dat
Grid opening area (mm2)	0.0130	Lat
Scale: 1L =	1.000	Lat
Scale: 1D =	1.000	Nui
Primary filter area (mm2)	385.0	Pre
Secondary Filter Area (mm2)	360.0	Pre
Category	Fleid	EP.
Filter Status	Analyzed 🔻	

	EPA Sample Number:	BA-000	38		
-2)	Sample Type	Air	•		
	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	890			
	Date received by lab	4/14/2009			
	Lab Job Number:	270900045			
	Lab Sample Number:	270900045	5-0010		
	Number of grids prepared	5			
	Prepared by	E.Wyatt-Pe	scador		
	Preparation date	4/15/2009			
	EPA COC Number	L14984			

Analyzed by	R. Pescador			
Analysis date	4/17/2009			
Prep	Indirect			
loose material or debris in the	Yes 🔻			
Counting rules	ISO (Air or Dust)			
Grid storage location	2709-BNS-38, J			
Archive filter(s) storage location	Westmont			
Enter the appropriate data in the cells t calculate the F-factor >>>>				
F- factor	0.25			
QA Type	Not QA			

EPA SAMPLE ID: LAB SAMPLE ID:

BA-00038 270900045-0010 Sample Type Air Count Rule 10312

QA by:

QA date:

Prep Indirect QA Type Not QA

ERROR CHECK OK - No errors found

Data Entry by: Data Entry date:

L.Ramowski 4/20/2009

T. Peters 4/21/2009

Maximu	Maximum # of Grid Openings Reached-Complete current GO then stop.																	
Grid	Grid	Grid	Grid	Grid	Grid	Structure	No. of Structures Dimensions (a)		Identification Mineral Class (b)									Fract. GO
Ond	Opening	Туре	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.		
1	J4	ND																
1	J6	ND								22.0								
1	J8	ND																
1	J10	ND																
1	11	ND																
1	15	ND											li de la companya de					
1	17	ND -																
1	19	ND																
1	H4	ND																
1	H6	ND																
1	H8	ND																
1	H10	ND																
1	G1	ND																
1	G3	ND																
11	G5	ND						en e										
1	G7	ND												1000				
1	G9	ND																
11	F2	ND																
1	F4	ND													Acres 1			
1	F6	ND											William III	- 24				
1	F8	ND																
1	F10	ND					7.0											
2	H2	ND							100				ALCOHOL:					
2	H4	ND					STATE OF STREET		17,100.00		16.60		Part Control					
2	H6	ND																
2	H8	ND											1000					
2	H10	ND							PROPERTY.				100000	<b>*</b> 0.00	3.91			
2	G1	ND			10 m		<b>Para</b>		200									
2	G3	ND					and the state of the state of	4.5 6.4		<b>3.5</b>			100	42		100		
2	G5	ND																
2	G7	ND				1000					1.45	and the second second						
2	G9	ND					Page 1997	100										
2	F2	ND							diet is		Other in							
2	F4	ND	7 4 4 5 5						(Control of		Carrier	Property and the second second						
2	F6	ND																

_			
2	F8	ND	
2	F10	ND	
2	E1	ND	
2	E3	ND	

## BA-00047\_270900045-0011\_ISO\_04-17 Vers

### BNSF 2008 Libby Site Investigation v33 TEM Asbestos Structure Count -- ISO 10312

### SAMPLE ID

Status Analyzed **EPA Sample Number** BA-00047 Not QA QA Type Lab Sample Number 270900045-0011

Sample Type Air Field Category Prep Direct Counting Rules 10312 **PARAMETERS** 

Effective filter area 385.0 mm2 1.00E+00 Indirect factor Number of Grid Openings (amphibole) 11 Number of Grid Openings (chrysotile) 11 Grid opening area 0.013 mm2

Volume (L) or Area (cm2) 1154 L Sensitivity (amphibole) 2.33E-03 s/cc Sensitivity (chrysotile) 2.33E-03 s/cc Area Examined (amphibole) 0.143 mm2 Area Examined (chrysotile) 0.143 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
> 3:1	0.5	none

Stopping Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0	-	
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK Grand total OK 0

CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00047\_270900045-0011\_ISO\_04-17-09\_D.xls

4/21/2009, 5:10 PM

EPA SAMPLE ID: LAB SAMPLE ID:

BA-00047 270900045-0011 Sample Type Air Count Rule 10312

Prep Direct
QA Type Not QA

ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 QA by: T. Peters 4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid	Structure	No. of S	tructures	Dimens	Dimensions (a) Identification			Mineral Class (b)			1 = ye	s, blank :	= no	Fract. GO	
Griu	Opening	Туре	Primary	Total	Length	Width	identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.
1	J1	ND														
1	J3	ND				7, 70,4734,0										
1	J5	ND														
1	J7	ND														
1	<b>J</b> 9	ND														
1	D7	ND														
2	G4	ND														
2	G6	ND			E. Constitue I		PGENE SECTION									
2	G8	ND											15000			
2	D8	ND														
2	D10	ND														

### **SAMPLE ID**

Status Analyzed
EPA Sample Number BA-00048
QA Type Not QA

Lab Sample Number 270900045-0012

Sample Type Air
Category Field
Prep Direct
Counting Rules 10312

### **PARAMETERS**

Effective filter area 385.0 mm2
Indirect factor 1.00E+00
Number of Grid Openings (amphibole) 11
Number of Grid Openings (chrysotile) 11
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 1165 L
Sensitivity (amphibole) 2.31E-03 s/cc

Sensitivity (amphibole) 2.31E-03 s/cc Sensitivity (chrysotile) 2.31E-03 s/cc Area Examined (amphibole) 0.143 mm2 Area Examined (chrysotile) 0.143 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)		
≥ 3:1	0.5	none		

Stopping Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
Grand total 0 OK

CONCENTRATION (s/cc)

OUTOETT TOTAL	CONTRACTION (GIOC)								
Bin	LA	OA	С	PCME(all)	PCME(asb)				
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>						
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>						
, c	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>						
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>						
e	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>						
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>						
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>				

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	þ	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00048\_270900045-0012\_ISO\_04-17-09\_D.xls

4/21/2009, 5:12 PM

FILE NAME: BA-00048 270900045-0012 ISO 04-17-09 Dixis

FILE TYPE: Original

### Recording Rules:

### Stopping Rules:

		<del></del>		
≥ 3:1	•	Minimum Aspect Ratio		Target Sensitivity
0.50		Minimum Length (um)	11	GOs required to reach target sensitivity
none		Minimum Width (um)		Maximum # of GOs
			50	Maximum # of Structure

Estimated # of GOs

### F-factor Calculation:

### Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial

### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

٧

### BNSF 2008 Libby Site Investigation v33

### **TEM Asbestos Structure Count**

	,		
Laboratory name:	EMSL27		EPA Sample Number:
Instrument	OL 100 CX	( II (27-2)	Sample Type
Voltage (KV)	100kv (		Air volume (L), dust sample area (cm2), or dustfall container area (cm2)
Magnification	19,000	)x	Date received by lab
Grid opening area (mm2)	0.0130		Lab Job Number:
Scale: 1L =	1.000	)	Lab Sample Number:
Scale: 1D =	1.000	)	Number of grids prepared
Primary filter area (mm2)	385.0	)	Prepared by
Secondary Filter Area (mm2)	360.0	)	Preparation date
Category	Field	•	EPA COC Number
Filter Status	Analyzed	▼	

	EPA Sample Number:	BA-00048		
-2)	Sample Type	Air	•	
	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1165		
	Date received by lab	4/14/2009		
	Lab Job Number: 270900		045	
	Lab Sample Number:	270900045	5-0012	
	Number of grids prepared	5		
	Prepared by	E.Wyatt-Pe	scador	
	Preparation date	4/15/20	09	
	EPA COC Number	L1498	4	

R. Pescador		
4/17/2009		
Direct	•	
No	~	
ISO (Air or Dust)	•	
2709-BNS-3	B, L	
Westmon	t	
1		
Not QA	•	
	4/17/2009 Direct No ISO (Air or Dust) 2709-BNS-34 Westmon	

EPA SAMPLE ID: LAB SAMPLE ID:

BA-00048 270900045-0012 Sample Type Air
Count Rule 10312

Prep Direct
QA Type Not QA

ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 QA by: T.Peters
QA date: 4/21/2009

	irrent GO, then stop.

2.11						***************************************										
Grid	Grid	Structure	No. of S	tructures	Dimens	ions (a)	Identification	dentification		Mineral Class (b)			1 = ye	s, blank	= no	Fract. GO
Gild	Opening	Туре	Primary	Total	Length	Width	identification	LA	OA	C	NAM	Comments	Sketch	Photo	EDS	Chrys.
1	12	ND				265 201 201 201 201 201 201 201							, imv			
1	14	ND														
1	16	ND														
1	18	ND														
1	<b>I</b> 10	ND														
1	E7	ND														
1	E9	ND														
2	G1	ND				6										
2	G3	ND														
2	G5	ND														
2	G7	ND														

### SAMPLE ID

Status Analyzed **EPA Sample Number** BA-00058 QA Type Not QA 270900045-0013 Lab Sample Number

Sample Type Air Field Category Direct Prep Counting Rules 10312

### **PARAMETERS**

Effective filter area 385.0 mm2 1.00E+00 Indirect factor Number of Grid Openings (amphibole) 25 Number of Grid Openings (chrysotile) 25 Grid opening area 0.013 mm2 Volume (L) or Area (cm2) 510 L 2.32E-03 s/cc Sensitivity (amphibole) Sensitivity (chrysotile) 2.32E-03 s/cc Area Examined (amphibole) 0.325 mm2 Area Examined (chrysotile) 0.325 mm2

Recording Min. AR Min length (um) Min width (um) Rules: ≥ 3:1 0.5 none

Stopping Target S Rules:

Max GOs Max N 0.0024 50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check ΟK OK OK Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	C	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
þ	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	C		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00058\_270900045-0013\_ISO\_04-17-09\_D.xls

4/21/2009, 5:14 PM

FILE NAME: BA-00058 270900045-0013 ISO 04-17-09 D.xis

FILE TYPE: Original

### Recording Rules:

#### Stopping Rules:

			-							
	≥ 3:1	•	Minimum Aspect Ratio	0.00240	Target Sensitivity					
0.50		0	Minimum Length (um)		GOs required to reach target sensitivity					
	none		Minimum Width (um)		Maximum # of GOs					
				50	Maximum # of Structure					
	F 64		aloudadtour	25	Estimated # of GOs					

### F-factor Calculation:

### Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

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### BNSF 2008 Libby Site Investigation v33 **TEM Asbestos Structure Count**

Laboratory name:	EMSL27		EPA Sample Number:	BA-00058		
Instrument	OL 100 CX II (27	-2	Sample Type	Air	•	
Voltage (KV)	100kv		Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	510		
Magnification	19,000x		Date received by lab	4/14/2	009	
Grid opening area (mm2)	0.0130		Lab Job Number:	270900045		
Scale: 1L =	1.000		Lab Sample Number:	270900045-0013		
Scale: 1D =	1.000		Number of grids prepared	5		
Primary filter area (mm2)	385.0		Prepared by	E.Wyatt-Pescador		
Secondary Filter Area (mm2) 360.0			Preparation date	4/15/2	4/15/2009	
Category	Field 🔻		EPA COC Number	L149	84	
Filter Status	Analyzed 🔻					

Analyzed by	R. Pescador		
Analysis date	4/17/2009		
Prep	Direct 🔻		
ir sample type = air, is there loose material or debris in the cowl?	No 🔻		
Counting rules	ISO (Air or Dust)		
Grid storage location	2709-BNS-38, M		
Archive filter(s) storage location	Westmont		
F- factor	1		
QA Type	Not QA		

EPA SAMPLE ID: BA-00058 LAB SAMPLE ID: 270900045-0013

Sample Type Air Count Rule 10312

QA by:

Direct Prep QA Type Not QA

ERROR CHECK OK - No errors found

Data Entry by: Data Entry date:

..Ramowski 4/20/2009

T. Peters QA date: 4/21/2009

	Complete current GO, t	

Margero	Target Sensitivity Reached-Complete current GO, then stop.															
Grid	Grid	Structure	No. of S	tructures	Dimens	ions (a)	Identification		Mineral	Class (b)			1 = yes, blank = no		Fract. GO	
Gila	Opening	Type	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.
1	J1	ND										1				
1	J3	ND													4	
1	J5 .	ND														
. 1	J7	ND ·										) Kanada				
1	J9 `	ND														
1	12	ND														
1	14	ND														
1	16	ND														
1	I10	ДN														
1	H1	ND														
1	Н3	ND														
1	H5	ND														
11	H7	ND														
1	H9	ND														
1	E8 -	ND :														
2	F1	ND	4.00	100000								(New York Control of the	<b>1</b>			
2	F3	ND														
2	F5 .	ND	4 (00 (00 (00))				agreem (this is a	30.00			<b>(4)</b>					
2	F7	ND 1														
2	F9	ND								e (6.5%)	4,84					
2	E2	ND							100	9 745						
2	E4	ND	200		9.75			**						100		
2	E6	ND					7.0			3						
2	E8	ND		100	14 35 3		100	as CA	2.0		445,18					
2	E10	ND	100			76.44		Mary 1987			100					

### SAMPLE ID

Status Analyzed
EPA Sample Number BA-00059
QA Type Not QA

Lab Sample Number 270900045-0014

Sample Type Air
Category Field
Prep Direct
Counting Rules 10312

### **PARAMETERS**

Effective filter area 385.0 mm2 Indirect factor 1.00E+00 Number of Grid Openings (amphibole) 25 Number of Grid Openings (chrysotile) 25 Grid opening area 0.013 mm2 Volume (L) or Area (cm2) 501 L Sensitivity (amphibole) 2.36E-03 s/cc Sensitivity (chrysotile) 2.36E-03 s/cc

Area Examined (amphibole) 0.325 mm2
Area Examined (chrysotile) 0.325 mm2

Recording<br/>Rules:Min. ARMin length (um)Min width (um)≥ 3:10.5none

Stopping Rules:

 Target S
 Max GOs
 Max N

 0.0024
 50

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK Grand total 0 OK

CONCENTRATION (s/cc)

#### Bin LA OA С PCME(all) PCME(asb) <DL <DL <DL а b <DL <DL <DL <DL <DL <DL C <DL <DL <DL d <DL <DL <DL е f <DL <DL <DL Total <DL <DL <DL <DL <DL

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00059 270900045-0014 ISO 04-17-09 D.xls

FILE TYPE: Original

**Recording Rules:** 

Stopping Rules:

≥ 3:1	•	Minimum Aspect Ratio	0.00240	Target Sensitivity					
0.50 <b>M</b> ini		Minimum Length (um)	25	GOs required to reach target sensitivity					
none		Minimum Width (um)		Maximum # of GOs					
			50	Maximum # of Structure					
F-fact	or C	alculation:	25	Estimated # of GOs					

### BNSF 2008 Libby Site Investigation v33 **TEM Asbestos Structure Count**

Laboratory name:	EMSL27		
Instrument	OL 100 CX II (27		
Voltage (KV)	100kv		
Magnification	19,000x		
Grid opening area (mm2)	0.0130		
Scale: 1L =	1.000		
Scale: 1D =	1.000		
Primary filter area (mm2)	385.0		
Secondary Filter Area (mm2)	360.0		
Category	Field		
Filter Status	Analyzed 🔻		

COMMENTS

EPA Sample Number: BA-00059				
Sample Type	Air	•		
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)				
Date received by lab	ved by lab 4/14/2009			
Lab Job Number:	270900045			
Lab Sample Number:	mber: 270900045-0014			
Number of grids prepared	5			
Prepared by	E.Wyatt-Pe	scado		
Preparation date	4/15/2009			
EPA COC Number	L14984			
	Sample Type  Air volume (L), dust sample area (cm2), or dustfall container area (cm2)  Date received by lab  Lab Job Number:  Lab Sample Number:  Number of grids prepared  Prepared by  Preparation date	Sample Type  Air  Air volume (L), dust sample area (cm2), or dustfall container area (cm2)  Date received by lab  Lab Job Number:  270900045  Number of grids prepared  5  Prepared by  E. Wyatt-Pereparation date		

Analyzed by	R. Pescador		
Analysis date	4/17/2009		
Prep	Direct 🔻		
in sample type – air, is there loose material or debris in the cowl?	No 🔻		
Counting rules	rules ISO (Air or Dust)		
Grid storage location	2709-BNS-38, N		
Archive filter(s) storage location	Westmont		
F- factor	1		
QA Type	Not QA		

### F-factor Calculation: Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

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### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

EPA SAMPLE ID: LAB SAMPLE ID:

BA-00059 270900045-0014 Sample Type Air
Count Rule 10312

QA by:

QA date:

Prep Direct
QA Type Not QA

ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 T. Peters 4/21/2009

	plete current GO.	

Grid	Grid	Structure	No. of S	tructures	Dimens	sions (a)	Identification		Mineral C	lass (b)	_		1 = ye	s, blank	Fract. GO
Gild	Opening	Туре	Primary	Total	Length	Width	identification	LA	OA	С		Comments	Sketch	Photo	Chrys.
1	J2 .	ND													
1	J4	ND													
1	J6	ND		and the second second											
1	J8	ND											7.3		
1	J10	ND													70.
1	11	ND				l									
1	13	ND													
11	15	ND													
1	17	ND													analem in a line in a line
1	19	ND													
1	H2	ND													
11	H4	ND		The second second		12.50									
1	H6	ND											red Atlanta		
1	H8	ND													
1	H10	ND						5 - 1 6 6							
2	12	ND											6389.0		
2	14	ND													
2	16	ND													
2	18	ND												38-6	
2	110	ND					10000		or and		W. A		100		
2	F1	ND	all little of			<b>100 E</b>				80 T 18 T	A sekit to		a de problem		
2	F3	ND			4 10 6										
2	F5	ND								100	200		40.00		
2	F7	ND					935-2-23-196			100					
2	F9	ND													



SAMPLE ID

Status

Analyzed 0

EPA Sample Number 0 QA Type LB

Lab Sample Number 270900045

Sample Type Air
Category Blank
Prep Indirect
Counting Rules 10312

**PARAMETERS** 

Effective filter area 360.0 mm2

Indirect factor 1.00E+00 Number of Grid Openings (amphibole) 10

Number of Grid Openings (chrysotile) 10
Grid opening area 0.013 mm2

Volume (L) or Area (cm2) 0 L
Sensitivity (amphibole) Blank s/cc

Sensitivity (chrysotile) Blank s/cc Area Examined (amphibole) 0.130 mm2

Area Examined (chrysotile) 0.130 mm2

Recording<br/>Rules:Min. ARMin length (um)Min width (um)≥ 3:10.5none

Stopping Rules: Target S Max GOs Max N 10 50

COUNTS (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	o	0		
е	0	О	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK OK Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а					
b					
С					
d					
е					
f					
Total					<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 270900045 ISO 04-17-09 [LB.xls

FILE TYPE: Original

### BNSF 2008 Libby Site Investigation v33

### **TEM Asbestos Structure Count**

***************************************			
Laboratory name:	EMSL27		
Instrument	OL 100 CX II (27		
Voltage (KV)	100kv		
Magnification	19,000x		
Grid opening area (mm2)	0.0130		
Scale: 1L =	1.000		
Scale: 1D =	1.000		
Primary filter area (mm2)	385.0		
Secondary Filter Area (mm2)	360.0		
Category	βlank <b>▼</b>		
Filter Status	Analyzed 🔻		

EPA Sample Number:			
Sample Type	Air	•	
Air voiume (L), dust sample area (cm2), or dustfall container area (cm2)			
Date received by lab			
Lab Job Number:	270900045		
Lab Sample Number:	270900045		
Number of grids prepared	5		
Prepared by	E.Wyatt-Pe	scado	
Preparation date	4/15/20	009	
EPA COC Number	L1498	4	

Analyzed by	R. Pescador		
Analysis date	4/17/2009		
Prep	Indirect		
loose material or debris in the	No	•	
Counting rules	ISO (Air or Dust)	•	
Grid storage location	2709-BNS-38, O		
Archive filter(s) storage location	Westmont		
Enter the appropriate data in the cells calculate the F-factor >>>>	to the right to		
F- factor			
QA Type	Lab Blank		
		-	

### Recording Rules:

Stopping	Rules:

	≥ 3:1	•	Minimum Aspect Ratio		Target Sensitivity		
0.50		0	Minimum Length (um)	10	target sensitivity		
none		e	Minimum Width (um)	10	Maximum # of GOs		
				50	Maximum # of Structure		
E factor Calculation				.s 10	Estimated # of GOs		

### F-factor Calculation:

### Indirect Prep Inputs

	1	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
-	100	First resuspension volume or rinsate volume (mL)
	100	Volume applied to secondary filter (mL) or used for serial dilution

### Inputs for Serial Dilutions

1	inputs for	Jenai Dilaudija
		Second resuspension volume (mL)
		Volume applied to secondary filter (mL) or used for serial dilution
		Third resuspension volume (mL)
		Volume applied to secondary filter (mL) or used for serial dilution

### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:	v
----------------------------------	---

EPA SAMPLE ID: LAB SAMPLE ID:

0 270900045 Sample Type Air Count Rule 10312

QA by:

QA date:

Prep Indirect
QA Type LB

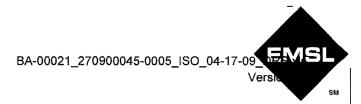
ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 T. Peters 4/21/2009

Maximum # of Grid Openings Reached-Complete current GO then stop.

Grid	Grid	Structure	No. of S	tructures	Dimens	ions (a)	Identification		Mineral C	lass (b)			1 = ye	s, blank :	= no	Fract. GO
Grid	Opening	Туре	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.
1	11	ND														
1	13	ND				and the second second										
1	15	ND														
1	17	ND														0.00
1	19	ND														
2	G2	ND														
2	G4	ND														
2	G6	ND														
2	G8	ND														
2	G10	ND								100						



### SAMPLE ID

Status Analyzed EPA Sample Number BA-00021

QA Type RS

Lab Sample Number

Sample Type Air
Category Field
Prep Direct
Counting Rules 10312

**PARAMETERS** 

Effective filter area 385.0 mm2 Indirect factor 1.00E+00 Number of Grid Openings (amphibole) 13 Number of Grid Openings (chrysotile) 13 Grid opening area 0.013 mm2

Volume (L) or Area (cm2)

Sensitivity (amphibole)

2.31E-03.s/cc

Sensitivity (amphibole) 2.31E-03 s/cc Sensitivity (chrysotile) 2.31E-03 s/cc Area Examined (amphibole) 0.169 mm2

Area Examined (chrysotile) 0.169 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

270900045-0005

Stopping Rules:

Target S	Max GOs	Max N
0.0024		50

**COUNTS** (based on countable structures only)

Bin	LA	OA	C	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	0		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK
Grand total 0 OK

CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)	
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>			
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>			
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>			
d	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>			
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td>***</td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>***</td><td></td></dl<></td></dl<>	<dl< td=""><td>***</td><td></td></dl<>	***		
f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>			
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>	

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: BA-00021 270900045-0005 ISO 04-17-09 DRS.xls

FILE TYPE: Original

### Recording Rules:

•

### Stopping Rules:

≥ 3:1	•	Minimum Aspect Ratio	V. U U L T U	Target Sensitivity		
0.50		Minimum Length (um)		GOs required to reach target sensitivity		
none		Minimum Width (um)		Maximum # of GOs		
			50	Maximum # of Structure		

Estimated # of GOs

### F-factor Calculation:

### Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

### Input for Ashing of Secondary Filter

Fraction	of	secondary	filter	used	for	ashin	Ę

F-factor

Grid opening traverse direction:

٧

## **BNSF 2008 Libby Site Investigation v33 TEM Asbestos Structure Count**

Laboratory name:	EMSL27	EPA Sample Number:	BA-00021	
Instrument	OL 100 CX II (27-	2) Sample Type	Air 🔻	
Voltage (KV)	100kv	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	988	
Magnification	19,000x	Date received by lab	4/14/2009	
Grid opening area (mm2)	0.0130	Lab Job Number:	270900045	
Scale: 1L=	1.000	Lab Sample Number:	270900045-0005	
Scale: 1D =	1.000	Number of grids prepared	5	
Primary filter area (mm2)	385.0	Prepared by	E.Wyatt-Pescado	
Secondary Filter Area (mm2)	360.0	Preparation date	4/15/2009	
Category	Field 🔻	EPA COC Number	L14984	
Filter Status	Analyzed 🔻		<b>—</b>	

Analyzed by	R. Pescador			
Analysis date	4/17/2009			
Prep	Direct	•		
in sample type = air, is there loose material or debris in the cowl?	No	~		
Counting rules	ISO (Air or Dust)	•		
Grid storage location	2709-BNS-38, E			
Archive filter(s) storage location	Westmont			
mana da sa				
F- factor	1			
QA Туре	Recount Same	•		

EPA SAMPLE ID: LAB SAMPLE ID: BA-00021 270900045-0005 Sample Type Air
Count Rule 10312

QA by:

QA date:

Prep Direct
QA Type RS

ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 T. Peters 4/21/2009

Target Sensitivity Reached-Complete current GO, then stop:

Grid	Grid	Structure	No. of S	tructures	Dimens	ions (a)	Identification		Mineral C	lass (b)			1 = ye	es, blank	= no	Fract. GO
Gila	Opening	Туре	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.
1	J5	ND										il de la companya de				
1	J7	ND							<u>.</u> [							
1	J9	ND		E							l de la constant de					
1	H7	ND														
1	H9	ND														
1	D7	ND														Land the state of the same
1	D9	ND													unes Z	
2	G1	ND														
2	G3	ND						11.00								
2	G5	ND														
2	G7	ND														
2	C8	ND														
2	C10	ND					1 may 1 mg 1 m			25.00						

# Versi

### **BNSF 2008 Libby Site Investigation v33 TEM Asbestos Structure Count -- ISO 10312**

### **SAMPLE ID**

Status Analyzed **EPA Sample Number** BA-00047 RD QA Type

270900045-0011 Lab Sample Number

Sample Type Air Category Field Direct Prep Counting Rules 10312

### **PARAMETERS**

Effective filter area 385.0 mm2 Indirect factor 1.00E+00 Number of Grid Openings (amphibole) 11 Number of Grid Openings (chrysotile) 11 Grid opening area 0.013 mm2 Volume (L) or Area (cm2) 1154 L Sensitivity (amphibole) 2.33E-03 s/cc Sensitivity (chrysotile) 2.33E-03 s/cc Area Examined (amphibole) 0.143 mm2

Area Examined (chrysotile)

0.143 mm2

Recording Rules:

Min. AR	Min length (um)	Min width (um)
> 3·1	0.5	none

Stopping Rules:

Target S	Max GOs	Max N
0.0024		50

COUNTS (based on countable structures only)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	0	0	0		
b	0	0	0		
С	0	0	O		
d	0	0	0		
е	0	0	0		
f	0	0	0		
Total	0	0	0	0	0
Check	OK	ОК	OK	4	

Check OK OK Grand total OK

CONCENTRATION (s/cc)

Bin	LA	OA	С	PCME(all)	PCME(asb)
а	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
b	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
С	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
d	<dl< td=""><td><dl.< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl.<></td></dl<>	<dl.< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl.<>	<dl< td=""><td></td><td></td></dl<>		
е	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
· f	<dl< td=""><td><dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td></td><td></td></dl<></td></dl<>	<dl< td=""><td></td><td></td></dl<>		
Total	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td><dl< td=""></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""></dl<></td></dl<>	<dl< td=""></dl<>

Туре	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	а			<5
OA = Other amphibole	b	<.5		· >= 5
C = Chrysotile	С		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	е	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

BA-00047 270900045-0011 ISO 04-17-09 DRD.xls

FILE NAME: BA-00047\_270900045-0011\_ISO\_04-17-09\_DRD.xls

FILE TYPE: Original

#### BNSF 2008 Libby Site Investigation v33

#### **TEM Asbestos Structure Count**

Laboratory name:	EMSL27	EPA Sample Number:	BA-00047	
Instrument	OL 100 CX II (27-2	Sample Type	Air	
Voltage (KV)	100kv	Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1154	
Magnification	19,000x	Date received by lab	4/14/2009	
Grid opening area (mm2)	0.0130	Lab Job Number:	270900045	
Scale: 1L=	1.000	Lab Sample Number:	270900045-001	
Scale: 1D =	1.000	Number of grids prepared	5	
Primary filter area (mm2)	385.0	Prepared by	E.Wyatt-Pescado	
Secondary Filter Area (mm2)	360.0	Preparation date	4/15/2009	
Category	Field	EPA COC Number	L14984	
Filter Status	Analyzed 🔻		···	

_						
	Analyzed by	E.Wyatt-Pescador				
	Analysis date	4/17/2009				
	Prep	Direct 🔻				
	loose material or debris in the	No 🔻				
	Counting rules	ISO (Air or Dust)				
1	Grid storage location	2709-BN\$-38, K				
	Archive filter(s) storage location	Westmont				
or						
	F- factor					
	QA Type	Recount Different				

#### Recording Rules:

#### Stopping Rules:

11010101	1141441	- ropping i	tuico.
≥ 3:1	Minimum Aspect Ratio	0.00240	Target Sensitivity
0.50	Minimum Length (um)		GOs required to reach target sensitivity
none	Minimum Width (um)		Maximum # of GOs
		50	Maximum # of Structure
F-factor C	alculation:	11	Estimated # of GOs

#### F-factor Calculation:

#### **Indirect Prep Inputs**

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing F-factor

Grid opening traverse direction:

٧

#### COMMENTS

EPA SAMPLE ID: LAB SAMPLE ID:

BA-00047 270900045-0011 Sample Type Air Count Rule 10312

Prep Direct QA Type RD

ERROR CHECK

OK - No errors found

Data Entry by: Data Entry date: L.Ramowski 4/20/2009 QA by: T. Peters 4/21/2009

Target Sensitivity Reached-Complete current GO, then stop.

	Grid	Structure			Dimens		Identification		Mineral C	lass (b)			1 = ye	s, blank	= no	Fract. GO
Grid	Opening	Туре	Primary	Total	Length	Width	identification	LA	OA	С	NAM	Comments	Sketch	Photo	EDS	Chrys.
1	J1	ND														
1	J3	ND												manda a debra constituel facilità di constitue		
1	J5	ND														
1	<b>J</b> 7	ND														
1	J9	ND														
1	D7	ND														
2	G4	ND														
2	G6	ND														
2	G8	ND														
2	D8	ND	La company													
2	D10	ND														

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

Structure

No. of Structures

EPA Sample Number:	BA-00001
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1344
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0001
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number:	114584 4000
Secondary filter pore size (um)	0,2

Analyzed by	
Analysis date	
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

Enter data in appropriate cells provided to the right---->

F-Factor Calculation (Indirect Preps Only):

Minimum Aspect Ratio (circ	ele one);
none ≥31	≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules	
Target Sensitivity:	0.0024
Max # of GOs:	10
Target # of Structures	50

#### F-factor Calculation:

Fract.

Indirect Prep Inputs

Fraction of primary filter used for Indirect prep or ashing [For dust and dustfall, enter 1.0] First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

#### Inputs for Serial Dilutions

(mL)

Second resuspension volume (mL) Volume applied to secondary filter (mt) or used for serial dilution Third resuspension volume (mL) Volume applied to secondary filter

Input for Ashing of Secondary Filter Fraction of secondary filter used for ashing

Grid	Grid Open	ina	Structure	No. of St	ructures	Dime	rsions	Identification	WIII	ierai Ciass	(see pero	w)	Sketch/ Comments	1 = ye	s, Diank -	· NO	GO
Ond	GIR Open	1119	Туре	Primary	Total	Length	Width	rae minagori	LA	OA	С	NAM	ORCIOI COMMENTS	Sketch	Photo	EDS	Chrys.
	_ (	2	VEI	Primary UO	9D9	0	_										
			-														
			-														
		_															
													,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		***************************************		
															· · · · · · · · · · · · · · · · · · ·	-	
														-			
L						l	l	J	<u> </u>	L	L	L	L	L	L		

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

Dimensions

C = Chrysotile

Mineral Class (see below)

NAM = Non-asbestos material

1 = yes, blank = no

Grid opening traverse direction (circle one):

H Horizontal

V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	38T
Secondary Filter Area (mm2)	340
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

Structure

Type

ND

ND

ND

ND

**a**Un

ND

ND

ND

Grid Opening

16

Grid

No. of Structures

Total

Primary

EPA Sample Number:	BA-00001
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1344
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0001
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	व भूग L14684 था
Secondary filter pore size (um)	0.2

Identification

LA

R. Pescador
4/16/2009
1
Yes
ISO
2709-BNS-38, A
Westmont
Not QA

F-Factor Calculation (Indirect Preps Only):

Sketch/ Comments

Enter data in appropriate cells provided to the right---->

Sketch

Recording Rules:	
Minimum Aspect Ratio (cir	rcle ane):
none (23:4)	≥5:1
Minimum Length (um).	0.5
Minimum Width (um);	None

Stopping Rule	<u>25.</u>			
Target Sensit	vity:		0.0024	
Max#ofGQs	4		¥9	RI
Target # of St	ructures:	-	50	4/17
	*****	and the second		فتت

#### F-factor Calculation:

Indirect Pren Inouts

Fract.

GO

Chrys.

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsat volume (mL)
50	Volume applied to secondary filter (mL) or used for serial dilution

#### Inputs for Serial Dilutions

Second resuspension volume (mL) Volume applied to secondary filter (mL) or used for serial dilution Third resuspension volume (mL)

Volume applied to secondary filter

#### input for Ashing of Secondary Filter Fraction of secondary filter used for

OA = Other (non-Libby type) amphibole

Dimensions

Length Width

C = Chrysotile

Mineral Class (see below)

С

NAM

OA

NAM = Non-asbestos material

1 = yes, blank = no

Photo

**EDS** 

Grid opening traverse direction (circle one): H Horizontal



Are prepped grids acceptable for analysis? (circle one) Yes No If No, explain:

LA	=	Libby-type	amphibole	

112

EMSL27 LAB NAME 270900045-0001 LAB SAMPLE NO.

EPA SAMPLE NO. SAMPLE TYPE

BA-00001

QA TYPE Not QA

LAB JOB NUMBER GRID STORAGE LOC. 2709-BNS-38, A

	1							-								Fract.
Grid	Grid Opening	Structure Type	No. of Str			nsions	Identification		Minera					s, blank		GO
<u> </u>			Primary	Total	Length	Width		LA	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS	Chrys.
1	G5	ND														
1	G7	ND														
	G9	ND														
	₹ <b>2</b>	ND														
	妆	ND														
	F6	ND					***************************************									
	Fg	ND								******						
	F10	ND				A. S.									-	
	<b>E</b>	NO					<b>-</b> 774									
	٤3	NO														
	25	ND													************	
	٤٦	MD														
1	29	ND														
2	12	ND				•										
2	J4	No									-					

LAB NAME EMSL27 LAB SAMPLE NO. 270900045-0001 EPA SAMPLE NO. SAMPLE TYPE

BA-00001 Α

QA TYPE Not QA

LAB JOB NUMBER GRID STORAGE LOC. 2709-BNS-38, A

	T 021												,			Fract.
Grid	Grid Opening	Structure Type	No. of Str			nsions	Identification		Minera					es, blank		GO Chrys.
			Primary	Total	Length	Width_		LA	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS	Othys.
2	36	ND		**********												
	78	NO														
	<b>G</b> 1	ND														
	Gs	NO														
	GT	NO							,							
	67	NO				***************************************										
	69	NO														
	C3	No														
	Ct	NO														
1	C7	ND														
3	<i>I7</i>	NO														
	I9	NO														
	F,6	MD														
1	F8	NO														
		pr	Phylos													

Laboratory name:	EMSL27
Instrument	JEOL 100 CX JI (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0,013
Scale: 1L=	1
Scale: 1D=	7
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

Structure

No. of Structures

EPA Sample Number:	BA-00002
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	/333
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0002
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number:	114884 1/40/09
Secondary filter pore size (um)	0.2

Analyzed by	
Anaiysis date	
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only): Enter data in appropriate cells provided to the right---->

Recording Rules:	
Minimum Aspect Ratio (circ	cle one):
none (3)	≥5;1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs.	
Target # of Structures:	50

## Grid Sketch/ Comments Grid Opening Identification GO Width NAM Photo Primary Total Length LA Sketch EDS Chrys.

E-	factor	Calc	ulation:

Fract.

Indirect Prep Inputs Fraction of primary filter used for indirect prep or ashing [For dust and dustfell, enter 1.0] First resuspension volume or rinsate volume (mL) Volume applied to secondary filter (mL) or used for serial dilution

Inputs for 8	Serial Dilutions
	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)
	•

Input for Ashing of Secondary Filter Fraction of secondary filter used for

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

Dimensions

C ≈ Chrysotile

Mineral Class (see below)

NAM = Non-asbestos material

1 = yes, blank = no

Grid opening traverse direction (circle one):

H Horizontal

V Vertical

Are propped grids acceptable for analysis? (circle one) Yes No If No, explain:

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

Structure

Туре

ろり

ND

ND

M

ND

NO

ND

Grid Opening

J2

口

17

Grid

No. of Structures

Total

Primary

EPA Sample Number:	BA-00002
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1333
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0002
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	المم و L14984 4101
Secondary filter pore size (um)	0.2

Identification

LA

Analyzed by	R Pescador
Analysis date	4/16/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	1
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38. E
Archive filter(s) storage location	Westmont
OA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

#### F-Factor Calculation (Indirect Preps Only):

Sketch/ Comments

NAM

Enter data in appropriate cells provided to the right---->

Sketch

Recording Rules:	
Minimum Aspect Ratio (cl	rcle ane):
none (23:1)	) ≥5:1
Minimum Length (um)	0.5
Minimum Width (um):	None

Stopping Rules.	
Target Sensitivity	0.0024
Max# of GOs;	39

#### F-factor Calculation:

Fract.

GO

Chrys.

Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsat volume (mL)
25	Volume applied to secondary filter (mL) or used for serial dilution

#### Inputs for Serial Dilutions

 1
Second resuspension valume (mL)
Volume applied to secondary filter (mL) or used for serial dilution
Third resuspension volume (mL)
 Volume applied to secondary filter (mL)

#### Input for Ashing of Secondary Filter Fraction of secondary filter used for

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

Dimensions

Length

Width

C = Chrysotile

Mineral Class (see below)

OA

NAM = Non-asbestos material

1 = yes, blank = no

Photo

EDS

Grid opening traverse direction (circle one): H Horizontal

Vertical

Are prepped grids acceptable for analysis? (circle one) If No, explain:



LAB NAME EMSL27 270900045-0002 LAB SAMPLE NO.

EPA SAMPLE NO. SAMPLE TYPE

BA-00002

QA TYPE Nat QA

LAB JOB NUMBER GRID STORAGE LOC. 2709-BNS-38, B

Grid	Grid	Structure	No. of Str	uctures	Dime	nsions	Identification		Minera	l Class			1 = ye	Fract. GO		
Grid	Opening	Туре	Primary	Total	Length	Width	Identification	LA	OA	c ·	NAM	Sketch/Comments	Sketch		ED\$	Chrys.
1	H8	NÞ														
	HIØ	ND														
	<b>63</b>	ND														
	GS	ND														
·	G7	ND														
	G9	ND														
	E2	ND														
	£4	ND														
	٤6	ND														
	83	ND														
	E10	ND												·		
	DI	ND														
	D3	ND														
	DS	ND							<b></b>							
1	<b>P</b> 7	ND														

 LAB NAME
 EMSL27
 EPA SAMPLE NO.

 LAB SAMPLE NO.
 270900045-0002
 SAMPLE TYPE

BA-00002

QA TYPE Not QA LAB JOB NUMBER 270900045
GRID STORAGE LOC. 2709-BNS-38, B

Grid	Grid	Structure	No. of Str	uctures	Dimensions		Dimensions Identification		Mineral Class				1 = ye	Fract. GO		
	Opening	Туре	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS	Chrys.
2	12	ND														
	J4	ND														
	16	ND								•						
	18	ND														
	J10	ND														
	II	N														
	13	ND														
	<b>45</b>	ND														
	I7	ND														
	109	ND														
	H2.	ND														
	114	ND														
	HB	ND														
1	48'	ND														
		SARYIN	6/00													

Laboratory name:	EMSL27
Instrument	JEOL 100 CX ((27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0,013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	3 <i>1</i> .C
Secondary Filter Area (mm2)	340
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

Structure

Type

NO

ND

ND

ND

NP

ND

ND

AD.

ND

D

EPA Sample Number:	BA-00011
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfail container area (cm2)	706
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0003
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 147 <u>L14684</u> 1710
Secondary filter pore size (um)	0.2

Identification

LA

R. Pescador
4/16/2009
D
NO PM
ISO
2709-BNS-38, C
Westmont
Not QA

#### F-Factor Calculation (Indirect Preps Only):

Sketch/ Comments

NAM

Enter data in appropriate cells provided to the right--->

Sketch

;1
e

Stapping Rules:	
Target Sensitivity:	0.0024
Max # of GOs;	18
Target # of Structures:	50

#### F-factor Calculation:

Fract.

GO

Chrys.

EDS

## Indirect Prep Inputs

indirect prep or ashing  [For dust and dustfall, enter 1.0]
First resuspension volume or rinsat volume (mL)
 Volume applied to secondary filter (mL) or used for serial dilution

#### Inputs for Serial Dilutions

Second resuspension volume (mL) Volume applied to secondary fifter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

#### Input for Ashing of Secondary Filter

Fraction of secondary filter used for

LA = Libby-type amphibole

Grid

Grid Opening

13

7ل

ロレ

12

エム

GZ

OA = Other (non-Libby type) amphibole

Dimensions

Length

Width

No. of Structures

Total

Primary

C = Chrysotile

Mineral Class (see below)

OA

NAM = Non-asbestos material

1 = yes, blank = no

Photo

Grid opening traverse direction (circle one); Horizontal

Vertical

Are prepped grids acceptable for analysis? (circle one) (Yes) No If No, explain:



 LAB NAME
 EMSL27
 EPA SAMPLE NO.
 BA-00011
 QA TYPE
 LAB JOB NUMBER
 270900045

 LAB SAMPLE NO.
 270900045-0003
 SAMPLE TYPE
 A
 Not QA
 GRID STORAGE LOC.
 2709-BNS-38, C

Grid	Grid	Structure	No. of Structures		Dimensions		- Identification	Identification Mineral Class		ation Mineral Class			1 = ye	es, blank	= no	Fract
	Opening	Туре	Primary	Total	Length	Width		LA	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS,	Chrys
2	Gi	ND		•••••												
	<b>G3</b>	ND								•						
	GS	ND														
	G7	ND														
	69	ND														
	E2	ND														
	84	ND														
	٤٧	ND							***************************************							
															***********************	
			X	£22												
			0		₩											

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0,015
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

Structure

Type

ND

ND

ND

ND

ND

ND

ND

No. of Structures

Primary

Total

EPA Sample Number:	BA-00012
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	687
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0004
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 pm L14\$84 4/17/6
Secondary filter pore size (um)	0.2

Identification

LA

R. Pescador
4/16/2009
р
1 NO MY
ISO
2709-BNS-38, D
Westmont
Not QA

F-Factor Calculation	(Indirect	Preps	Only);

Sketch/ Comments

Enter data in appropriate cells provided to the right---->

Sketch

Recording Rules:	
Minimum Aspect Ratio (ci	rcle one):
none (23:1)	25:1
Minimum Length (um).	0.5
Minmum Width (um):	None

Stopping Rules,	
Target Sensitivity	0.0024
Max # of GOs.	18
Target # of Structures:	50

#### F-factor Calculation:

Indirect Prep Inputs Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0) First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for S	Serial Dilutions
	Second resuspension volume (mL
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter Fraction of secondary filter used for

Flo ND ND J2 LA = Libby-type amphibole

154

Grid

Grid Opening

JZ

OA = Other (non-Libby type) amphibole

Dimensions

Width

Length

C = Chrysotlle

Mineral Class (see below)

С

NAM

OA

NAM = Non-asbestos material

1 = yes, blank = no

Photo

EDS

Grid opening traverse direction (circle one):

Vertical

Are prepped grids acceptable for analysis? (circle one) Yes )No If No, explain:

Fract.

GO

Chrys.



Horizontal

LAB NAME EMSL27

LAB SAMPLE NO. 270900045-0004

EPA SAMPLE NO. BA-00012
SAMPLE TYPE A

QA TYPE Not QA LAB JOB NUMBER 270900045

GRID STORAGE LOC. 2709-BNS-38, D

Grid	Grid Opening	Structure	No. of Str	uctures	Dime	nsions	Identification		Minera	Class	-		1 = y	es, blank	= no	Fract. GO
Ond -		Туре	Primary	Total	Length	Width		LA	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS	Chrys
2_	<b>I</b> 4	ND													****	
1	I6	ND														
	T\$	ND														
	110	ND														
	EI	ND														
	٤3	ND														
	25	ND				,										
+	27	NP													,	
			Resou													
			CARY YILL	eg							•					
													·			

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0.013
Scale: 1L=	1
Scale: 1D =	
Primary filter area (mm2)	38T
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00021
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	988
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0005
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 MY L14\$84 417
Secondary filter pore size (um)	0,2

Analyzed by	R. Pescador
Analysis date	4/16/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	.D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	NO ANT
Counting rules (ISO, AHERA, ASTM)	iso
Grid storage location	2709-BNS-38, E
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA
Reconciliation, Lab Blank, Interlab)	

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right---->

Recording Rules:	
Minimum Aspect Ratio (circ	le one):
none ≥3.1	≥5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity: 0.0024	
Max # of GOs: 13	
Target # of Structures: 50	

#### F-factor Calculation:

Indirect Pre	p Inputs
	Fraction of primary filter used for
	Indirect prep or ashing
	[For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

# Inputs for Serial Dilutions Second resuspension volume (mL) Volume applied to secondary filter (mL) or used for serial dilution Third resuspension volume (mL) Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter
Fraction of secondary filter used for ashing

Grid	Grid Opening	Structure	No. of St	ructures	Dime	Dimensions Identification		Mir	eral Class (	(see belo	w)	Sketch/ Comments	1 = ye	s, blank	no no	Fract.
GNG	Gra Opening	Туре	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	OREIGH GOMMENTS	Sketch	Photo	EDS	Chrys.
1	W	NO	_													
Ĺ	<b>V7</b>	N											~~~			
	19	ND	-													
	47	ND			_ :											
	+19	ND														
	P7	ND											_			
J	D9	ND														
2	Gi	ND														
	63	NO													<u>-</u>	
1	65	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grld opening traverse direction (circle one):

H Horizontal

V Vertical

Are prepped grids acceptable for analysis? (circle one) (



EMSL27 LAB NAME LAB SAMPLE NO. 270900045-0005

EPA SAMPLE NO.

SAMPLE TYPE

BA-00021 Α

QA TYPE Not QA

LAB JOB NUMBER GRID STORAGE LOC. 2709-BNS-38, E

Grid	Grid	Structure	No. of Sta	ructures	Dimensions		Dimensions Identification				Minera	l Class			1 = yes, blank = no			Fract. GO
	Opening	Туре	Primary	Total	Length	Width	, acrianoanor	LA	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS	Chrys		
z	G7	ND					·	-										
	CS	ND																
+	C10	ND																
-																		
,																		
•					-	_												
							-											
		_							-									
				XGH	7								·					
					7 The ag													
							<b>1</b>											
	_																	
						1												

≥ 5.1

.0.5

None

#### **BNSF 2008 Libby Site Investigation v33** TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL:100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000×
Grid opening area (mm2)	0.013
Scale: 1L =	
Scale: 1D =	
Primary filter area (mm2)	38r
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00022
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1016
Date received by łab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0006
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 MM L14\$84 #H
Secondary filter pore size (um)	0,2

R. Pescador
4/17/2009
D
NI) par
ISO
2709-BNS-38, F
Westmont
Not QA

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	13
Target # of Structures	50

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right---->

Grid	Grid Opening	Structure	No. of St	ructures	Dimer	nsions	Identification	Mir	neral Class	(see belo	w)	Sketch/ Comments	1 = ye	es, blank	= no	Fract. GO
	Grid Operaring	Туре	Primary	Total	Length	Width	identification	LA	OA	С	NAM	OKEIOI J OOMINENIA	Sketch	Photo	EDS	Chrys.
1	I8	ND														
1	Hay	ND														
	F7	ND														
	DS	ND														
	77	ND														
$\perp$	c8	ND											•			
+	C10	ND	*****										_			
1	ttl	ND														
1	H3	N														
+	45	ND		l 												

F	-fa	ctor	Ca	lau	ılati	ior

Recording Rules.

Minimum Length (um):

Minimum Width (um):

Minimum Aspect Ratio (circle one):

Indirect Prep Inputs Fraction of primary filter used for Indirect prep or ashing [For dust and dustfall, enter 1.0] First resuspension volume or rinsate volume (mL) Volume applied to secondary filter

Inputs for Serial Dilutions

Second resuspension volume (mL)

(mL) or used for serial dilution

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter Fraction of secondary fliter used for

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

Horizontal

 $\circ$ Vertical Are prepped grids acceptable for analysis? (circle one) (Yes) No



If No, explain:

 LAB NAME
 EMSL27
 EPA SAMPLE NO.
 BA-00022
 QA TYPE
 LAB JOB NUMBER
 270900045

 LAB SAMPLE NO.
 270900045-0006
 SAMPLE TYPE
 A
 Not QA
 GRID STORAGE LOC.
 2709-BNS-38, F

Grid	Grid	Structure	No. of Str	ructures	Dime	ensions	Identification		Minera	l Class			1 = ye	es, blank	= no	Fract.
Olig	Opening	Туре	Primary	Total	Length	Width	IGGIIIIICGIION	LA	OA	С	NAM	Sketch/Comments	Sketch		EDS	GO Chrys.
2	HT	ND														
* ***	<b>ρ</b> γ	ND														
+	Dy	NO														
									_							
		1														
				رص				•••								
				WANTER OF THE PARTY OF THE PART	_											
				¥						***************************************						
				-												-
			_													
								**********								

Laboratory name:	EMSL27
Instrument	JEOL: 100 CX (I (27-2)
Voltage (KV)	100
Magnification	19,000×
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0,8

No. of Structures

EPA Sample Number:	BA-00029
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1145
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0007
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	4 um L14\$84 4171
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	NO PRINTED
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, G
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

Calculation (Indirect Preps Only):
------------------------------------

Enter data in appropriate cells provided to the right---->

Recording Rules:	
Minimum Aspect Ratio (cir	rcie one):
none ≥3:1	≥51
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rule	<b>\$</b> .
Target Sensitiv	vity: 0.0024
Max # of GOs.	16 (16 (16 (16 (16 (16 (16 (16 (16 (16 (
Target # of Str	uctures 50

#### F-factor Calculation:

Fract.

Indirect Prep Inputs Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0] First resuspension volume or rinsate volume (mL) Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions Second resuspension volume (mL) Volume applied to secondary filter (mL) or used for serial dilution Third resuspension volume (mL) Volume applied to secondary filter

Input for Ashing of Secondary Filter Fraction of secondary filter used for

Grid	Grid Opening	Structure	140. 0/ 36	iuotates	Oine	1910113	Identification	14111	iciai Ciass	(See Seid	**)	Sketch/ Comments	1 ye	o, Dialin	- 110	GO
	Ond Opening	Туре	Primary	Total	Length	Width	IGCITITIOALION	LA	OA	С	NAM		Sketch	Photo	EDS	Chrys.
i	13	ND											_			
	72	ND										, , , , , , , , , , , , , , , , , , ,				
	<b>J</b> 7	NP													************	
<b></b>	19	ND														
	¢7	ND	_													
+	cg	ND														
2	16	No														
1	J8	ND												-		
	016	NO										***************************************			~~	
+	Dη	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

Dimensions

C = Chrysotile

Mineral Class (see below)

NAM = Non-asbestos material

1 = ves. blank = no

Grid opening traverse direction (circle one):

Horizontal

Vertical

Are prepped grids acceptable for analysis? (circle one) Yes, No If No, explain:



EMSL27 LAB NAME 270900045-0007 LAB SAMPLE NO.

EPA SAMPLE NO.

SAMPLE TYPE

BA-00029 Α

QA TYPE Not QA

LAB JOB NUMBER

270900045 GRID STORAGE LOC. 2709-BNS-38, G

Grid	Grid	Structure	No. of Str	uctures	Dime	nsions		ļ	Minera	Class			1 = y	es, blank	= no	Fract.
	Opening	Туре	Primary	Total	Length	Width		LA	OA _	С	NAM	Sketch/Comments	Sketch	Photo	EDS	Chrys
2	D9	No														
	,															
			Reg	9												
			<i>A</i>	P. Ja								100000000000000000000000000000000000000				
				1			-									
		·														1
										120000						
						\ \								_		

≥ 5:1

0.5

None

## BNSF 2008 Libby Site Investigation v33 TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0.013
Scale: 1L =	
Scale: 1D=	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary fitter pore size (um)	0.8

EPA Sample Number:	BA-00030
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1145
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0008
Number of grids prepared	<b>5</b>
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 pm L14\$84 4HD
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	NO pm
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, H
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

Stopping Rules.

Target Sensitivity: 0.0024

Max # of GOs: 11

Target # of Structures: 50

#### F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right---->

Grid	Crid Opening	Structure	No. of Sti	ructures	Dime	nsions	Identification	Mir	neral Class	(see belo	w)	Sketch/ Comments	1 = ye	es, blank	= no	Fract. GO
Gild	Grid Opening	Туре	Primary	Total	Length	Width	identification	LA	OA	С	NAM	Sketch Comments	Sketch	Photo	EDS	Chrys.
1	F2	ND						none-								
	#4	ND											_			
	<b>F6</b>	NO														
	F8	ND														
	FLO	NO														
	D6	ND														
<b>+</b>	D8	ND														
2	FI	ND														
	F3	NO														
+	Fs	No														

#### F-factor Calculation:

Recording Rules:

none

Minimum Length (um):

Minimum Width (um):

Minimum Aspect Ratio (circle one):

Indirect Prep Inputs

Fraction of primary filter used for Indirect prep or ashing

[For dust and dustfell, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter

Input for Ashing of Secondary Filter
Fraction of secondary filter used for ashing

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):
H Horizontal



Vertical



LAB NAME EMSL27 LAB SAMPLE NO. 270900045-0008 EPA SAMPLE NO. SAMPLE TYPE

BA-00030

**QA TYPE** 

LAB JOB NUMBER GRID STORAGE LOC. 2709-BNS-38, H

Grid	Grid	Structure	No. of Str	uctures	Dime	nsions	Identification		Minera	Class	-		1 = y	es, blank	= no	Frac
	Opening	Туре	Primary	Total	Length	Width		LA	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS	Chrys.
•	F7	ND														
						, <u></u>		ı								
						3 4 4 7 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4										
		Hamilton		>												
					X	<b>*</b>		,	10.00							

≥ 5.1

0.5

None

## BNSF 2008 Libby Site Investigation v33 TEM Asbestos Structure Count

Laboratory name:	EMSL27				
Instrument	JEOL:100 CX II (27-2)				
Voltage (KV)	100				
Magnification	19,000X				
Grid opening area (mm2)	0.013				
Scale: 1L =	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1				
Scale: 1D =	1				
Primary filter area (mm2)	385				
Secondary Filter Area (mm2)	340				
Category (Field, Rep., Dup., Blank)	Field				
Primary filter pore size (um)	0.8				

EPA Sample Number:	BA-00037
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	739
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0009
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number:	9 pm L14684 4/PU
Secondary filter pore size (um)	0.2

Analyzed by	
Analysis date	
Method (D=Dlrect, I=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage tocation	
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

Stopping Rules:

Target Sensitivity: 0.0024

Max # of GOs: 1.7

Target # of Structures: 50

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right---->

Grid	Grid Opening	Structure	No. of Structures		Dimer	nsions	Identification	Min	eral Class	see belo	w)	Sketch/ Comments	1 = ye	s, blank	= no	Fract. GO
	Ond opening	Туре	Primary	Total	Length	Width		LA	OA	С	NAM		Sketch	Photo	EDS	Chrys.
	- Di	12R	WA!	080												
		•														
	_		-													
	_										_					-
													**********			
				-												
-						*****										
						)	]				Ì			1		Ì

-factor	Cal	lcu	at	or	1:
			,		_

Recording Rules:

none

Minimum Length (um):

Minimum Width (um):

Minimum Aspect Ratio (circle one):

Indirect Prep Inputs
Fraction of primary filter used for Indirect prep or ashing IfFor dust end dustfell, enter 1.0)
First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Volume applied to secondary filter (mL) or used for serial dilution

Second resuspension volume (mL)

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter
Fraction of secondary filter used for

aching

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0,013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	38T
Secondary Filter Area (mm2)	385 360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

Structure

Type

ND NO

ND

ND

ND

ND

ND

ND

ND

No. of Structures

Total

Primary

EPA Sample Number:	BA-00037
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	739
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0009
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 AM
Secondary filter pore size (um)	0.2

Identification

LA

Analyzed by	R, Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	AI Alia
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	Iso
Grid storage location	2709-BNS-38, I
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Sketch/ Comments

Enter data in appropriate cells provided to the right---->

Sketch

Minimum Aspect Ratio (circ	ile one)
none 3	,e ciney. ≥5:1
Minimum Length (um).	0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	39
Target # of Structures:	50

#### F-factor Calculation:

Indirect Pren Innuts

HIGHEOL! IC	pripate
05	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
25	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

Second resuspension volume (mL
 Volume applied to secondary filter (mL) or used for serial dilution
Third resuspension volume (mL)
Volume applied to secondary filter

Input for Ashing of Secondary Filter Fraction of secondary filter used for

LA = Libby-type amphibole

Grid

Grid Opening

W

J7

19

**I**2

**I**4

OA = Other (non-Libby type) amphibole

Dimensions

Length

Width

C = Chrysotile

Mineral Class (see below)

С

NAM

OA

NAM = Non-asbestos material

1 = yes, blank = no

Photo

Grid opening traverse direction (circle one);

H Horizontal

(V) Vertical

Are prepped grids acceptable for analysis? (circle one) (Fes) No If No, explain:

Fract.

GO

Chrys.

ED8



EMSL27 LAB NAME LAB SAMPLE NO. 270900045-0009

EPA SAMPLE NO. BA-00037 Α SAMPLE TYPE

QA TYPE Not QA

LAB JOB NUMBER GRID STORAGE LOC. 2709-BNS-38, I

Grid	Grid Opening	Structure	No. of Str	uctures	Dimensions		Identification		Minera	l Class	·		1 = y	es, blank	= no	Fract. GO
		Туре	Primary	Total	Length	Width_		LA	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS	Chrys.
1	H2,	ND														
<u> </u>	Het	ND							***************************************							
	116	ND														
	F18,	N()														
	#10	ND			777777777	·····										
	G2	NO						_								
	G4	Ng														
	G6	ND														
	G8	M														
+	GID	ND					٨									
2	Iz	ND														
1	Iψ	NO														
	J6	No														
	Ig I	No					•		7.7.7.44.44.44.44.44.44.44.44.44.44.44.4							
1	Ĭ10	ND		***************************************					74		1					

Α

EMSL27 LAB NAME 270900045-0009 LAB SAMPLE NO.

EPA SAMPLE NO. BA-00037 SAMPLE TYPE

QA TYPE Not QA

270900045 LAB JOB NUMBER GRID STORAGE LOC. 2709-BNS-38, I

Grid	Grid Opening	Structure	No. of Str	ructures	Dime	nsions	Identification	Mineral Class					1 = yes, blank = no			Fract. GO
Grid		Туре	Primary	Total	Length	Width		LA	OA	С	NAM	Sketch/Comments	Sketch		EDS	Chrys.
2	41	NO							en.							
	НЗ	ND														
	H5	ND														
	H7	ND														
	H9	NO														
	62	ND														
	G4	NO														
	66	ND														
	G8	ND									<u> </u>					
	G10	NO														
	FI	NP						-								
	F3	ND				-										
	F5	NO														
<b>*</b>	<b>#7</b>	ND			_										***************************************	
		- p	J411109													

≥ 5:1

0.5

None

## BNSF 2008 Libby Site Investigation v33 TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0.013
Scale: 1L =	
Scale: 1D =	1
Primary filter area (mm2)	-81
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00038
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	800
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0010
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number:	9 P4 L14 <b>8</b> 84 7
Secondary filter pore size (um)	0,2

Analyzed by	
Analysis date	
Method (D=Direct, l=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

Stopping Rules.

Target Sensitivity: 0.0024

Max # of GOs:

Target # of Structures: 50

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right---->

Grid	Grid Opening	Structure	No. of St	ructures	Dime	nsions	Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract.	
GIIG	Gild		Type	Primary	Total	Length	Width	rac(ithodion	LA	OA	С	NAM	OKCIONI GOVINIONIS	Sketch	Photo	EDS	Chrys
	-07	1ERL	OAD	ED													
	-																
													······································				
<u></u>					-											-	
					1											1	

direct	Prep Inp			
	Concet	ion of a	rimanı	€.

F-factor Calculation:

Recording Rules:

none

Minimum Length (um):

Minimum Width (um):

Minimum Aspect Ratio (circle one):

Fraction of primary filter used for indirect prep or ashing [For dust end dustfall, enter 1.0]
First resuspension volume or rinsate volume (ml.)

Volume applied to secondary filter

----

Inputs for Serial Dilutions

Second resuspension volume (mL)

(mL) or used for serial dilution

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter
Fraction of secondary filter used for

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No If No, explain:


Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19.000X
Grid opening area (mm2)	O.DI3
Scale: 1L ≠	1
Scale: 1D =	
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	366
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

Structure

Type

ND

Nh

ND

NA

N

No. of Structures

Total

Primary

EPA Sample Number:	BA-00038
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	890
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0010
Number of grids prepared	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	4 p/m/ L14 <b>5</b> 84 41nj a
Secondary filter pore size (um)	0.2

Identification

LA

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	Yes
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, J
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Sketch/ Comments

Enter data in appropriate cells provided to the right---->

Sketch

1 = yes, blank = no

Photo

Recording Rules:  Minimum Aspect Ratio (circ	
none (≥3.1)	ae one). ≥5:1
Minimum Length (um)	0.5
Minimum Width (um):	None
minitali vadit (am).	ivone

Stopping Rules:	
Target Sensitivity.	0.0024
Max # of GOs:	39
Target # of Structures:	50

#### F-factor Calculation:

Indirect Prep Inputs

Fract.

GO

Chrys.

EDS

Fraction of primary filter used for Indirect prep or ashing [For dust and dustfall, enter 1.0] First resuspension volume or rinsate

100 volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions Second resuspension volume (mL)

> Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter

Input for Ashing of Secondary Filter Fraction of secondary filter used for

LA = Libby-type amphibole

146

Grid

Grid Opening

]4

NO

II)

IS

I9

OA = Other (non-Libby type) amphibole

Dimensions

Length

Width

C = Chrysotile

Mineral Class (see below)

C

NAM

OA

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

Horizontal

Vertical

Are prepped grids acceptable for analysis? (circle one)



If No, explain:

 LAB NAME
 EMSL27
 EPA SAMPLE NO.
 BA-00038
 QA TYPE
 LAB JOB NUMBER
 270900045

 LAB SAMPLE NO.
 270900045-0010
 SAMPLE TYPE
 A
 Not QA
 GRID STORAGE LOC.
 2709-BNS-38, J

Grid	Grid Opening	Structure	No. of Str	uctures	Dime	mensions Identification		Mineral Class		Mineral Class			1 = y	es, blank	= no	Fract. GO
Gila		Туре	Primary	Total	Length	Width	Identification	LA_	OA	С	NAM	Sketch/Comments	Sketch		EDS	Chrys
	#8	ND														
	HØ	NO				*******										
	GI	No														
	G3	NO														
	GS <sup>-</sup>	NO								1	ļ					
	<b>G</b> 7	No														
	<b>G9</b>	No														
	FZ	ND						,,,,								
	Fø	No									<u></u>					
	FL	NO									ļ	,				
	F8	Np														
-	FIO	ND														
	HZ.	No				L										
	#4	NO														
	46	NO														

LAB NAME <u>EMSL27</u>

LAB SAMPLE NO. 270900045-0010

EPA SAMPLE NO. BA-00038
SAMPLE TYPE A

QA TYPE Not QA LAB JOB NUMBER 270900045
GRID STORAGE LOC. 2709-BNS-38, J

Grid	Grid Structure No. of Structures Dimensions Identification		Minera	l Class			1 = yes, blank = no									
Gild	Opening	Туре	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS	GO Chrys.
2	178	NO													•	
	HIP	NO														
	GI	No														
	63	No														
	Gr	No														
	<b>G</b> 7	NO									•	,				
	69	NP													44	
	F2	No														
	F40	No										·				
	F6	NO														
	Fg	No														
	FIO	No														
	EI	No														
7	<b>E</b> 3	NO											-			
	<b>—</b>	emyly	)e													

≥ 5:1

0.5

None

#### BNSF 2008 Libby Site Investigation v33 **TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (1 (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	6,013
Scale: 1L =	
Scale: 1D =	
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00047
Sample Type (A=Air, D=Dust, DF = Dustfall):	<b>A</b>
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1154
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900046-0011
Number of grids prepared	<b>5</b>
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 MM
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador	
Analysis date	4/17/2009	
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D	
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	NO MAY	<i>ר0 ק</i>
Counting rules (ISO, AHERA, ASTM)	ISO	
Grid storage location	2709-BNS-38, K	
Archive filter(s) storage location	Westmont	
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA	

Target Sensitivity: 0.0024 Max # of GOs: 11 Target # of Structures: 50.

Stopping Rules:

Recording Rules:

none

Minimum Length (um):

Minimum Width (um):

Minimum Aspect Ratio (circle one):

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right---->

Grid	Grid Opening	Structure	No. of St	ructures	Dimensions		Identification -	Mir	neral Class	(see belo	ow)	Sketch/ Comments	1 = y	es, blank	= no	Fract. GO
Uilu	Glid Operating	Туре	Primary	Total	Length	Width	identification -	LA	OA	С	NAM	GREECH COMMENTS	Sketch	Photo	EDS	Chrys.
	Jı	ND														
	J3	ND														
	77	ND														
	J7	NO														
	J9	NO	· · · · · · · · · · · · · · · · · · ·													
+	707	NO														
2	G4	ND														
	66	ND														
	G8	ND														
+	DR	ND														

F-factor Calculation
----------------------

Indirect Prep Inputs Fraction of primary filter used for Indirect prep or ashing [For dust and dustfall, enter 1.0] First resuspension volume or rinsate volume (mL) Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions Second resuspension volume (mL) Volume applied to secondary filter (mL) or used for serial dilution Third resuspension volume (mL) Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter Fraction of secondary filter used for

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal (V) Vertical

Are prepped grids acceptable for analysis? (circle one) (Yes? No If No, explain:



LAB NAME EMSL27 270900045-0011 LAB SAMPLE NO.

EPA SAMPLE NO.

SAMPLE TYPE

BA-00047

**QA TYPE** Not QA

LAB JOB NUMBER

270900045 GRID STORAGE LOC. 2709-BNS-38, K

Grid	Grid	Structure	No. of Structures		Dimensions		Identification	,,,,,	Minera	Class	· -		1 = yes, blank = no			Fract. GO
	Opening	Туре	Primary	Total	Length	Width		LA	OA	c	NAM	Sketch/Comments	Sketch	Photo	EDS	Chrys
· 	DIO	ND														
															,	
*******																
			Je													
			3	I Like												
				X40					***************************************							
					1											
											ļ .					
									***************************************						-	
						\			····							

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0.0(3
Scale: 1L=	1
Scale: 1D=	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

Structure

Type

ろ

ND

ND

ND

ND

NO

ND

NO

ND

No. of Structures

Total

Primary

EPA Sample Number:	BA-00048
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	.1165
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0012
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	4 pan L14884 411
Secondary filter pore size (um)	0.2

Identification

LA

4/17/2009
D
No pery
ISO
2709-BNS-38, L
Westmont
Not QA

EDS

Fract.

GO

Chrys.

1 = yes, blank = no

Photo

F-Factor Calculation (Indirect Preps Only):

Sketch/ Comments

Enter data in appropriate cells provided to the right---->

Sketch

Recording Rules:	
Minimum Aspect Ratio (circ	ele one):
none (≥3:1)	≥6:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules
Farget Sensitivity 0.0024
Max#of GOs: 11
Target # of Structures: 50

#### F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0] First resuspension volume or rinsate volume (mL) Volume applied to secondary filter

Inputs for Serial Dilutions

Second resuspension volume (mL)

(mL) or used for serial dilution

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

LA = Libby-type amphibole

Grid

Grid Opening

<u>I</u>4

Ib

II8

IIB

89

61

1G3

GS

OA = Other (non-Libby type) amphibole

Dimensions

Length

Width

C = Chrysotile

Mineral Class (see below)

С

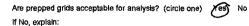
NAM

OA

NAM = Non-asbestos material

Grid opening traverse direction (circle one): Horizontal

Vertical



LAB NAME EMSL27

LAB SAMPLE NO. 270900045-0012

EPA SAMPLE NO. BA-00048
SAMPLE TYPE A

QA TYPE Not QA LAB JOB NUMBER 270900045
GRID STORAGE LOC. 2709-BNS-38, L

Grid	Grid	Structure	No. of Str	ructures	Dime	nsions	Identification   L		Minera	l Class			1 = yes, blank = no			Fract. GO
	Opening	Туре	Primary	Total	Length	Width		LA	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS	Chrys.
2	G7	ND														
		<b>.</b>														
							-									
									AGGARA							
				93												
				E E												
				X												

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0,013
Scale: 1L =	
Scale: 1D=	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	366
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

Structure

Type

NO

NO

ND

No. of Structures

Total

Primary

EPA Sample Number:	BA-00058
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	510
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900046-0013
Number of grids prepared	5
Prepared by	E Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 MT L14 <b>9</b> 84 4170
Secondary filter pore size (um)	0.2

Identification

LA

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	אועם פען דיינוף דיינוף דיינוף
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, M
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):
Enter data in appropriate cells provided to the right>

Sketch/ Comments

Recording Rules:	
Minimum Aspect Ratio (circ	le one):
none (£3,1)	≥5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules	
Target Sensitivity:	0.0024
Max # of GOs	25
Target # of Structures:	.50

#### F-factor Calculation:

Fract.

GO

Chrys.

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing [For dust and dustfail, enter 1.0]
First resuspension volume or rinsate volume (mL)
 Volume applied to secondary filter

Volume applied to secondary filt (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL
Volume applied to secondary filter (mL), or used for serial dilution
Third resuspension volume (mL)
 Volume applied to secondary filter

Input for Ashing of Secondary Filter
Fraction of secondary filter used for ashing

LA = Libby-type amphibole

IIO

IZ

Grid

Grid Opening

OA = Other (non-Libby type) amphibole

Dimensions

Width

Length

C = Chrysotile

Mineral Class (see below)

OA

С

NAM

NAM = Non-asbestos material

1 = yes, blank = no

Photo

EDS

Sketch

Grid opening traverse direction (circle one):

H Horizontal

V Vertical

Are prepped grids acceptable for analysis?	(circle one)	(
If No, explain:		



No

LAB NAME EMSL27 LAB SAMPLE NO. 270900045-0013 EPA SAMPLE NO. SAMPLE TYPE

BA-00058 Α

**QA TYPE** Not QA

LAB JOB NUMBER GRID STORAGE LOC. 2709-BNS-38, M

Grid	Grid	Structure	No. of Str	ructures	Dime	nsions	Identification	000	Minera	l Class	·		1 = y	es, blank	= no	Fract. GO
	Opening	Туре	Primary	Total	Length	Width		LA	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS	Chrys.
1	H3	NO														
	HE	ND														
	47	NO		·····												
	119	NO														
+	E8	No							~						_	
2	FI	ND							4							
	F3	μD														
	FS	ND														
	F7	ND														
	F9	No														
	Er	NO						•••	***************************************							
	<b>E4</b>	No				207777										
	ΣÇ	ND													_	
	E8	ND			_											
•	210	No														

≥ 5:1

0.5

None

#### BNSF 2008 Libby Site Investigation v33 TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	38√
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00059
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	501
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0014
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	1484 41010
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	NO PMY
Counting rules (ISO, AHERA, ASTM)	180
Grid storage location	2709-BNS-38, N
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

Target Se	ensitivity:	0.0024
Max # of	GO:	25

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right---->

Grid	Grid Opening	Structure	Structure No. of Structures		Dimensions		Identification	Mineral Class (see below)			Sketch/ Comments				Fract. GO	
Gild G	Grid Operang	Туре	Primary	Total	Length	Width	Identification	LA	OA	С	NAM	Sketchi Comments	Sketch	Photo	EDS	Chrys.
1	JZ	NO														
	J4	NO														
	16	NO														
	18	NO														
	110	ND														
$\perp$	I)	ND		_											_	-
	<del>43</del>	ND														
	17	ND		<u>.</u>	_											
	I7	ND										_				
1	I9	NO														

F-	fac	tor	Ca	lcu	lat	ion	ľ

Recording Rules:

none

Minimum Length (um):

Minimum Width (um):

Minimum Aspect Ratio (circle one):

Indirect Prep Inputs
Fraction of primary filter used for

indirect prep or ashing
(For dust and dusifall, enter 1.0)
First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter
(mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mi.) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mt.)

Input for Ashing of Secondary Filter
Fraction of secondary filter used for

ashing

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grld opening traverse direction (circle one):

H Horizontal

) Vertical

Are prepped grids acceptable for analysis? (circle one) If No, explain:



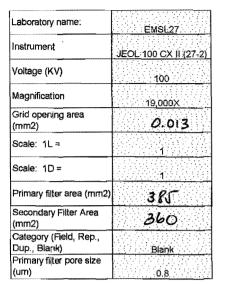
) No

LAB NAME <u>EMSL27</u>
LAB SAMPLE NO. 270900045-0014

EPA SAMPLE NO. BA-00059
SAMPLE TYPE A

QA TYPE Not QA LAB JOB NUMBER 270900045
GRID STORAGE LOC. 2709-BNS-38, N

Grid	Grid Opening		No. of Str	uctures	Dime	nsions		Mineral Class				1 = yes, blank = no			Fract. GO	
Oliu -		Туре	Primary	Total	Length	Width		LA	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS	Chrys.
1	H2_	No														
	44	No														
	46	Ng		NATION OF THE PROPERTY OF												
	48	ND														
1	HID	ND														
2	IZ	ND														
	<b>1</b> 4	40												:		
	16	No														
	I8	ND														
	110	No														
	FI	No														
	F3	NO						-								
	FS	ND			·											
	F7	ND										,				
-	F9	No														



Structure

Type

NO

NO

ND

NO

ND

No

NO

NO

No

MD

No. of Structures

Total

Primary

EPA Sample Number:	
Sample Type (A=Air, D=Dust, DF = Dustfail):	Α
Air volume (L), dust area (cm2), or dustfall container area (cm2)	
Date received by lab	
Lab Job Number:	270900045
Lab Sample Number:	270900045
Number of grids prepared	3
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	4 Mar L14884 4/17
Secondary filter pore size (um)	0.2

Identification

LA



Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2709-BNS-38, O
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Lab Blovik

Fract.

GO

Chrys.

F-Factor Calculation (Indirect Preps Only):

Sketch/ Comments

NAM

Enter data in appropriate cells provided to the right--->

Sketch

Recording Rules:	
Minimum Aspect Ratio (circ	ele one):
none ≥ 3:1	≥5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

Stopping Rules:			
Target Sensitivit	У		
Max # of GOs:			10
Target # of Stru	ctures		50

#### F-factor Calculation:

Indirect Prep Inputs

1.0

Fraction of primary filter used for indirect prep or ashing [For dust and dustfell, enter 1,0]

First resuspension volume or rinsate volume (ml.)

folume applied to se

100

100

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for S	erial Di	lution
--------------	----------	--------

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter

Input for Ashing of Secondary Filter
Fraction of secondary filter used for

LA = Libby-type amphibole

Grid

Grid Openinal

I

I3

IS

IT I9

(72

GY

Gb

GR

OA = Other (non-Libby type) amphibole

Dimensions

Length

Width

C = Chrysotile

Mineral Class (see below)

OA

NAM = Non-asbestos material

1 = yes, blank = no

Photo

EDS

Grid opening traverse direction (circle one):

H Horizontal

(V) Vertical

Are prepped grids acceptable for analysis? (circle one) If No, explain:



No



Laboratory name:	EMSL27
Instrument	JEOL 100 CX JI (27-2)
Voltage (KV)	100
Magnification	19,000X
Grid opening area (mm2)	0.013
Scale: 1L=	1
Scale: 1D =	100
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Fletd
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00021
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	988
Date received by lab	4/14/2009
Lab Job Number:	270900045
Lab Sample Number:	270900045-0005
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	4/15/2009
EPA COC Number:	9 MM L14884 411105
Secondary filter pore size (um)	0,2

Analyzed by	R. Pescador
Analysis date	4/17/2009
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	JSO
Grid storage location	2709-BNS-38, E
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Recount Same

F-Factor	Calculation	(Indirect	Preps	Only):

Enter data in appropriate cells provided to the right---->

Minimum Aspect Ratio (cir	cle one):
none 31	≥51
Minimum Length (um)	:0.5
Minimum Width (um):	None

Stopping Rules:	
Target Sensitivity:	0.0024
Max # of GOs:	13
Target # of Structures:	50

#### F-factor Calculation:

Indirect Prep Inputs
Fraction of primary filter used for Indirect prep or ashing
[For dust and dustfall, enter 1.0] First resuspension volume or rinsate volume (mL) Volume applied to secondary filter

(mL) or used for serial dilution

Inputs for S	Serial Dilutions							
	Second resuspension volume (m							
	Volume applied to secondary filter (mL) or used for serial dilution							
	Third resuspension volume (mL)							
	Volume applied to secondary filter							

Input for As	hing of Secondary Filter
	Fraction of secondary filter used for
	ashing

Grid	Grid Grid Opening	Structure	No. of St	ructures	Dimer	nsions	Identification	Mir	neral Class	(see belo	w)	Sketch/ Comments	1 = ye	es, blank	= no	Fract. GO
Sna	Ond Opening	Туре	Primary	Total	Length	Width		LA	OA	С	NAM	Cheton Comments	Sketch	Photo	EDS	Chrys.
1	77	No														
	J7	ND														
	19	NO														
	H7	ND											_			
	H9	ND														
	לע	ND														
1	D9	ND														
2	al	ND														
	G3	ND								,						
1	65	No														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one): H Horizontal

Vertical

Are prepped grids acceptable for analysis? (circle one) If No, explain:



LAB NAME EMSL27 270900045-0005 LAB SAMPLE NO.

EPA SAMPLE NO.

SAMPLE TYPE

BA-00021 Α

QA TYPE Recount Same

LAB JOB NUMBER 270900045 GRID STORAGE LOC. 2709-BNS-38, E

Grid	Grid	Structure	No. of Str	uctures	Dime	nsions	Identification	Mineral Class				1 = ye	es, blank	= no	Fract. GO	
	Opening	Туре	Primary	Total	Length	Width		L <u>A</u>	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS	Chrys.
2	G7	No														
	<b>C8</b>	NO										-				
1	CID	NO														
1																
							.									
				En												
				4												

LAB NAME EMSL27

LAB SAMPLE NO. 270900045-0011

EPA SAMPLE NO.
SAMPLE TYPE

BA-00047 A

QA TYPE

Recount Different

LAB JOB NUMBER 270900045

GRID STORAGE LOC. 2709-BNS-38, K

Grid Grid		Structure	No. of Str	uctures	Dime	nsions	Identification		Minera				1 = ye	es, blank	= no	Fract GO
Openin	Opening	Туре	Primary	Total	Length	Width		LA	OA	С	NAM	Sketch/Comments	Sketch	Photo	EDS	Chrys.
2	DIO	ND														
								·								
<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>																
				ET LE												
					Cq.											
															_	

## **Chain of Custody Record**

## **Libby Asbestos Investigation**

No. L14984

From:	CDM
	60 Port Blvd, Ste. 200
	Libby, MT 59923

U.S. Environmental Protection Agency, Region VIII 1595 Wynkoop Street Denver, CO 80202-1129

Send to:	EMSL-Mobile Lab		 
	107 W 4th St		
	Libby, MT 59923		

via: 🗹 hand delivery 🗌 shipped

Date Shipped: 4/14/2009
Carrier Name: Hand-delivered
Airbill: NA

Sample Placed in Cooler/Bag	Index ID	Suffix ID	Sample Date	Sample Media (S=Soil; W=Water; D=Dust; A=Air; B=Bulk Insulation)	Volume (L) or Area (cm2)	Filter Pore Size (um)	Turn Around Time	Analysis Request	Comments	Sampl Receive by La
7	BA-00001		9/17/2008	Α	\ 1344 L	8.0	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	F
1	BA-00002		9/17/2008	Α	→ 1333 L	8.0	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	T
J=	BA-00011		9/18/2008	Α	706 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	E
7	BA-00012		9/18/2008	Α	687 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	T
T	BA-00021		9/19/2008	A	` 988 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	12
	BA-00022		9/19/2008	Α	~ 1016 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	
	BA-00029		9/22/2008	Α	→ 1145 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	IL
	BA-00030		9/22/2008	Α	、1145 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	14
	BA-00037		9/23/2008	A	~ 739 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	Ī
	BA-00038		9/23/2008	Α	> 890 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	T
7	BA-00047		9/24/2008	Α	√ 1154 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	T
	BA-00048		9/24/2008	Α	→ 1165 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	I
7	BA-00058		9/25/2008	Α	∼ 510 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	#OU6RW1008-A	F
	BA-00059		9/25/2008	Α	~ 501 L	0.8	10 Day	TEM-ISO10312 (ISO 10312:1995 (E))	p #OU6RW1008-A	T
	· · · · · · · · · · · · · · · · · · ·		<u> </u>	·	<u> </u>				<del>\(\daggregarrightarrow\)</del>	

Total Number of Samples14	END OF	SUBMITTAL		
Additional Comments: Glesse Ace att	achment			
2.1	,			
Skai Com 4-14.	-09 1611 Efth	I. What fescula (EMS)	4/14/09/14	II OK & accrept
Relinquished by (Signature and Company)		(Signature and Company)	Daté/Time	Sample Condition upon Receipt
Elmla J. Matt-Per cador/Emst	-6/8/09/1255			
Relinquished by (Signature and Company)	Date/Time Received by	(Signature and Company)	Date/Time	Sample Condition upon Receipt
Relinquished by (Signature and Company)	Date/Time Received by	(Signature and Company)	Date/Time	Sample Condition upon Receipt